

**Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department**



Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on

3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision:An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission:Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives:They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure:All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: AL-Nahrain University.....

Faculty/Institute: .Engineering. College.....

Scientific Department: .Mechanical Engineering Department.....

Academic or Professional Program Name: Mechanical Engineering.....

Academic Program Description Form

University Name: Al-Nahrain University

Faculty/Institute: College of Engineering

Scientific Department: Mechanical Engineering Department

Academic or Professional Program Name: Bachelor of Science in Mechanical Engineering

Final Certificate Name: Bachelor of Science in Mechanical Engineering

Academic System: Semester

Description Preparation Date:

File Completion Date: 7/4/2024

Signature: _____

Head of Department Name:

Prof. Dr. Akeel Abdullah Mohammed

Date: 7/4/2024

Signature: _____

Scientific Associate Name:

Prof Dr. Naseer Abboud Al-Haboubi

Date: 7/4/2024

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Asst. Prof. Ali Sabri Abbas

Date: 15/4/2024

Signature: _____

Approval of the Dean

أ.د. جعفر سلمان جبار
عميد كلية الهندسة

1. Program Vision

The department of mechanical engineering endeavors to be one of the leading mechanical engineering programs in Iraq and in the region.

2. Program Mission

- 1- Graduating highly qualified ethical mechanical engineers.
- 2- Building a qualified leadership in its graduates through teaching aids, teamwork and professionalism at work.
- 3- Instilling in graduates the spirit for acquiring knowledge and continues learning.
- 4- Contributing ideas of projects and carrying out research for the benefit and development of the community.
- 5- Advising the students and encouraging them to use and develop their skills

3. Program Objectives

- 1- Graduate mechanical engineers that are able to achieve the requirements of industry and other practical applications
- 2- Improving teaching and managerial activities to meet the international standards.
- 3- Improving the academic abilities of the faculty and high skillfulness of the staff.
- 4- Improve the qualifications management and technical supporting staff
- 5- Optimum use resources and potentials of the department
- 6- Establishing viable applied researches that generate knowledge for local and foreign markets.

4. Program Accreditation

Not Yet.

5. Other external influences

Yes, Ministry of Higher Education and Scientific Research

6. Program Structure

Reviews*	Percentage	Credit hours	Number of Courses	Program Structure
Basic	8%	16	8	Institution (University) Requirements
Basic	46%	58	13	College Requirements
Basic and Optional	62.6%	124	39	Department Requirements
			1	Summer Training
			0	Other

* This can include notes whether the course is basic or optional.

7. Program Description

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MATH110	Mathematics I	108	67	7	B	-
CHEM180	Chemistry	63	37	4	B	-
COMP140	Computer Fundamentals and Programming	78	72	6	S	-
HUDE110	Human Rights and Democracy	33	42	3	S	-
MEER110	Static	93	57	6	C	-
PHYS110	Physics I	78	22	4	B	-

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSW L	USSWL	ECTS	Type	Pre-request
MATH120	Mathematics II	93	82	7	B	MATH110
PHYS120	Physics II	63	37	4	B	PHYS110
MEER224	Dynamic	93	32	5	C	MEER110
ENGL130	English Language I	48	52	4	S	-
WORK140	Workshope	30	45	3	S	-
DRAW130	Engineering Drawing	123	52	7	C	-
Year/Level	Course Code	Course Name	Credit Hours			
SECOND YEAR / FIRST SEMESTER			theoretic al	Practical		
	MEER211	Principles of Management	1	-		
	UREQ211	Arabic Language II	1	-		
	''	English Language II	2	-		
	MATH210	Mathematics III	3	-		
	MEER210	Mechanics of Materials I	2	-		
	MEER212	Fluid Mechanics I	2	-		
	MEER213	Thermodynamics I	2	2		
	MEER215	Metallurgy	2	2		
SECOND YEAR / SECOND SEMESTER			theoretic al	Practical		
	UREQ221	Democracy	1	-		
	MEER225	Manufacturing Processes	2	-		
	MEER224	Mechanical Constructions	1	3		
	MATH220	Mathematics IV	3	-		
	MEER220	Mechanics of Materials II	2	2		
	MEER222	Fluid Mechanics II	2	2		
	MEER223	Thermodynamics II	2	-		
THIRD YEAR / FIRST SEMESTER			theoretic al	Practical		
	CREQ311	Engineering Statistics	2	-		
	MEER310	Eng. and Num. Analysis I	3	-		
	MEER311	Heat Transfer I	2	-		

	MEER312	Internal Combustion Engines I	2	2
	MEER313	Machine Design I	3	-
	MEER314	Mechanics of Machines I	2	2
	MEER315	Industrial Engineering	2	-
	MEER316	Electrical Machines	2	2
THIRD YEAR / SECOND SEMESTER			theoretic al	Practical
	CREQ321	English Language III	2	-
	MEER320	Eng. and Num. Analysis II	3	-
	MEER321	Heat Transfer II	2	2
	MEER322	Internal Combustion Engines . II	2	-
	MEER323	Machine Design II	3	-
	MEER324	Mechanics of Machines II	2	-
	MEER325	Production Engineering	2	-
	MEER326	Mechanical Vibrations	2	2
	MEER327	Gas Dynamics	2	-
FORTH YEAR / FIRST SEMESTER			theoretic al	Practical
	CREQ410	Project	-	4
	UREQ411	English Language IV	2	
	MEER410	Control Engineering and Measurements I	3	-
	MEER411	Air-Conditioning and Refrigeration I	3	2
	MEER412	Power Plants I	2	-
	MEER413	Advanced Computer programming	2	2
	MEER414	Turbo- Machinery	2	-
	MEER415	CAD CAM system/ Solar Energy	2	-
FORTH YEAR / SECOND SEMESTER			theoretic al	Practical
	CREQ420	Project	-	4
	UREQ421	Engineering Ethics	1	-
	MEER420	Control Engineering and Measurements II	3	2
	MEER421	Air-Conditioning and Refrigeration II	3	-
	MEER422	Power Plants II	1	2

8. Expected learning outcomes of the program	
Knowledge	
Learning Outcomes 1	A1-An ability to apply knowledge of mathematics, science, and engineering A2-An ability to identify, formulate, and solve engineering problems A3- The ability to make sound engineering decisions.
Skills	
Learning Outcomes 2	B1-An ability to design and conduct experiments, as well as to analyze and interpret data.
Learning Outcomes 3	B2-An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. B3- An ability to function on multidisciplinary teams. B4- An ability to communicate effectively
Ethics	
Learning Outcomes 4	C1- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
Learning Outcomes 5	C2- An understanding of professional and ethical responsibility.

9. Teaching and Learning Strategies
Lectures, Experimental work, Applications, Assignments, Homework, and Discussion.

10. Evaluation methods

Examinations, Assignments, Homework, Discussion, Lab reports, and Graduation project.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof. DR.		7			√	
Assist. Prof. Dr.		12			√	
Lecturer Dr.	1	6			√	
Lecturer		1			√	
Assist. Lecturer		12			√	

Professional Development

Mentoring new faculty members

The department directs and engages new faculty members by merging them with old faculty members to deal with how to manage the classroom and scientific material.

Professional development of faculty members

The department has a plan and arrangements for the development of academic and professional staff and faculty members by developing a strategy to involve them in teaching courses, workshops and questionnaires to develop the professional reality and raise the level of teaching and learning.

12. Acceptance Criterion
To enrollment in the college by central admission by MOHERS

13. The most important sources of information about the program
Student's admission guide issued by MOHERS.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
FIRST YEAR/FIRST SEMESTER	MATH110	Mathematics I	Basic	√							√		√		
	CHEM180	Chemistry	Basic	√							√		√		
	COMP140	Computer Fundamentals and Programming	Basic	√							√		√		
	HUDE110	Human Rights and Democracy	Basic				√						√		
	MEER110	Static	Basic		√			√					√		
	PHYS110	Physics I	Basic	√							√		√		
	MATH110	Mathematics I	Basic										√		
FIRST YEAR/SECOND SEMESTER	MATH120	Mathematics II	Basic	√							√		√		
	PHYS120	Physics II	Basic	√							√		√		
	MEER224	Dynamic	Basic		√								√		
	ENGL130	English Language I	Basic				√				√	√	√		

	WORK140	Workshope	Basic				√					√			
	DRAW130	Engineering Drawing	Basic		√						√		√		
SECOND YEAR / FIRST SEMESTER	MEER211	Principles of Management	Basic								√		√		
	UREQ211	Arabic Language II	Basic				√				√				
	UREQ210	English Language II	Basic				√				√		√		
	MATH210	Mathematics III	Basic	√									√		
	MEER210	Mechanics of Materials I	Basic		√			√							
	MEER212	Fluid Mechanics I	Basic		√			√					√		
	MEER213	Thermodynamics I	Basic		√			√					√		
SECOND YEAR / SECOND SEMESTER	UREQ221	Democracy	Basic		√		√				√				
	MEER225	Manufacturing Processes	Basic		√			√					√		
	MEER224	Mechanical Constructions	Basic		√			√					√		
	MATH220	Mathematics IV	Basic								√				
	MEER220	Mechanics of Materials II	Basic		√				√				√		

	MEER222	Fluid Mechanics II	Basic		√				√				√		
	MEER223	Thermodynamics II	Basic		√						√		√		
THIRD YEAR / FIRST SEMESTER	CREQ311	Engineering Statistics	Basic								√		√		
	MEER310	Eng. and Num. Analysis I	Basic	√							√		√		
	MEER311	Heat Transfer I	Basic		√				√				√		
	MEER312	Internal Combustion Engines I	Basic		√				√				√		
	MEER313	Machine Design I	Basic		√								√		
	MEER314	Mechanics of Machines I	Basic		√				√				√		
	MEER315	Industrial Engineering	Basic		√				√				√		
	MEER316	Electrical Machines	Basic		√				√				√		
	CREQ321	English Language III	Basic				√				√		√		
	MEER320	Eng. and Num. Analysis II	Basic	√							√		√		
THIRD YEAR / SECOND SEMESTER	MEER321	Heat Transfer II	Basic		√			√			√		√		

	MEER322	Internal Combustion Engines . II	Basic		√			√			√		√		
	MEER323	Machine Design II	Basic		√				√				√		
	MEER324	Mechanics of Machines II	Basic		√			√			√		√		
	MEER325	Production Engineering	Basic		√			√			√		√		
	MEER326	Mechanical Vibrations	Basic		√			√			√		√		
	MEER327	Gas Dynamics	Basic		√			√			√		√		
FORTH YEAR / FIRST SEMESTER	CREQ410	Project	Basic		√			√					√		
	UREQ411	English Language IV	Basic				√				√		√		
	MEER410	Control Engineering and Measurements I	Basic		√			√					√		
	MEER411	Air-Conditioning and Refrigeration I	Basic		√			√					√		
	MEER412	Power Plants I	Basic		√			√					√		
	MEER413	Advanced Computer programming	Basic	√							√	√			

FORTH YEAR / SECOND SEMESTER	MEER414	Turbo- Machinery	optiona I	√			√				√		√		
	MEER415	CAD CAM system/ Solar Energy	optiona I	√			√				√	√			
	CREQ420	Project	Basic	√							√		√		
	UREQ421	Engineering Ethics	Basic	√							√		√		
	MEER420	Control Engineering and Measurements II	Basic	√			√						√		
	MEER421	Air-Conditioning and Refrigeration II	Basic	√			√					√			
	MEER422	Power Plants II	Basic	√			√						√		
	MEER423	Computer Applications	Basic	√				√			√	√			
	MEER424	Mechanical Systems Design	optiona I	√							√	√			
	MEER425	Renewable Energy	optiona I	√			√	√					√		

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer Fundamentals and Programming		Module Delivery
Module Type	Support		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COMP140		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	1	Semester of Delivery	1
Administering Department	mechanical	College	engineering
Module Leader	Suha Kareem Jebir	e-mail	Suha.K.Jebir@nahrainuniv.edu.iq
Module Leader's Acad. Title	Asst. Lecturer	Module Leader's Qualification	MS.c
Module Tutor	Haider N. faisal	e-mail	Haider.faisal@nahrainuniv.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	07/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1.Understanding the MATLAB environment 2.Enhance the students skills in programing using MATLAB language 3.Being able to do simple calculations using MATLAB

	4. Sharpening the students skills in logical and mathematical thinking 5. Being able to carry out simple numerical computations and analyses using MATLAB 6. Write simple programs in MATLAB to solve scientific and mathematical problems
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	LO-1 Able to use MATLAB for interactive computations. LO-2 write programs in MATLAB M-files LO-3 use the special function of MATLAB LO-4 Familiar with strings and matrices and their use. LO-5. Able to generate plots and export this for use in reports and presentations. LO-6 The student will be able to solve basic ordinary differential equations. LO-7 Create programs designed to solve simple problems LO-8 Creates conditional control and loop control LO-9 Able to use basic flow controls (if-else, for, while).
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Starting with MATLAB Describing the characteristics and purpose of the different windows in MATLAB. Command Window is introduced in detail. 2. Creating Arrays & Mathematical Operations with Arrays The array is a fundamental form that MATLAB uses to store and manipulate data. An array is a list of numbers arranged in rows and/or columns. 3. Two-Dimensional Plots Plots are a very useful tool for presenting information. This is true in any field, but especially in science and engineering, where MATLAB is mostly used. MATLAB has many commands that can be used for creating different types of Plots. 4. Symbolic Math All of the mathematical operations done with MATLAB , Many applications in science, and engineering require symbolic operations, which are mathematical operations with expressions that contain symbolic variables. The result of such operations is a mathematical expression in terms of the symbolic variables. 5. Polynomials & Curve Fitting Polynomials are mathematical expressions that are frequently used for problem solving and modeling in science and engineering. Curve fitting is a process of finding a function that can be used to model data. 6. Programming in MATLAB A computer program is a sequence of computer commands. In a simple program the commands are executed one after the other in the order they are typed. MATLAB provides several tools that can be used to control the flow of a

	program. Conditional statements make it possible to skip commands or to execute groups of commands in different situations. For loops and while loops make it possible to repeat a sequence of commands several times.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is 1. Defining the programming as a tool and how to distinguish between different programming language 2. Know the basics of programming and how to simulate a problem 3. Understand the meaning of each programming tool and how to choose the optimal one for each problem 4. Specify the problems and analyze it into algorithmic way

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	12	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes				
	Assignments	7	5% (5)	2-8	LO # 2-7
	Projects / Lab.	1	15% (15)	Continuous	All
	Report	1	10%		

Summative assessment	Midterm Exam	1hr	20% (20)	7	LO # 1-9
	Final Exam	3hr	60% (60)	16	All
			100% (100 Marks)		
Delivery Plan المخطط الزمني					
	Material Covered				
Week 1	Starting with MATLAB + Using Script				
Week 2	Creating Arrays + Mathematical Opera				
Week 3	Two-Dimensional Plots&FORMATTIN				
Week 4	SYMBOLIC OBJECTS AND SYMB				
Week 5	Solving Mathematical Equations +mid				
Week 6	SOLVING AN ORDINARY DIFFERE				
Week 7	Complex Numbers and Limits of Funct				
Week 8	POLYNOMIALS				
Week 9	CURVE FITTING + solving problems				
Week 10	Programming in MATLAB (LOOPS)				
Week 11	NESTED LOOPS AND NESTED COM				
Week 12	Solved problems				
Week 13	Mid2				
Week 14	Final lab exam				
Week 15	Preparatory week before the final Ex				
Week 16					
Total assessment					

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Starting with MATLAB + open & save Script Files
Week 2	Creating Arrays + Mathematical

	Operations with Arrays
Week 3	Two-Dimensional Plots&FORMATTING A PLOTwith figure window + solving problems
Week 4	Solving Mathematical Equations + solving problems
Week 5	POLYNOMIALS + CURVE FITTING + solving problems
Week 6	Programming in MATLAB (LOOPS)
Week 7	Final lab exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in Library
Required Texts	MATLAB AN INTRODUCTION WITH APPLICATIONS By AMOS GILAT Sixth edition @ 2017	Yes
Recommended Texts	-MATLAB® Handbook with Applications to Mathematics, Science, Engineering, and Finance By José Miguel David Báez-López David Alfredo BáezVillegas 2019. - MATLAB® A Practical Introduction to Programming and Problem Solving By Stormy Attawayfifth edition @2019	No
Websites	https://www.mathworks.com/products/matlab-online.html	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information						
Module Title	<u>Dynamics</u>		Module Delivery			
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☒ Practical ☐ Seminar			
Module Code	<u>MEER224</u>					
ECTS Credits	<u>5</u>					
SWL (hr/sem)	<u>93</u>					
Module Level	1	Semester of Delivery		2		
Administering Department	Mechanical Eng	College	College of engineering			

Module Leader	Dr. Nadhim Naseer	e-mail	Nadhim.na.nadhim@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	-	e-mail	-
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	-/06/2023	Version Number	-

Relation with other Modules

Prerequisite module	MEER110	Semester	1
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	- GO-1: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies - GO-2: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
Module Learning Outcomes	- CLO-1: understanding the principles of motion - CLO-2: understanding the differences between kinematics and kinetics - CLO-3: understanding the type of motion (linear motion , curve motion - CLO-4: understanding the coordinates of motion (normal tangential coordinates , Polar Coordinates) - CLO-5: understanding the principles of energy and type of energy and solve problem - CLO-6: understanding newton s second law of motion and solve problem

Indicative Contents	Indicative content includes the following. Description of Motion ,Rectilinear Motion and plane motion , Problems , Projectiles , Normal and Tangential Coordinates Motion (n-t) , Problems. [12hrs] Polar Coordinates Motion (r-Θ) ,Relative Motion , Problems, Constrained Motion , Newton's Second Law of Motion Problems. [12hrs] Work and Energy ,Linear Impulse and Momentum Problems. [12hrs] , Impacts ,Problems , Plane Kinematics of Rigid Bodies , Rotation, Angular Motion , Problems[12hrs] Absolute Motion ,Relative Velocity , Problems , Relative Velocity , Rotation, Angular Motion , Problems. [12hrs] Instantaneous Center of Zero Velocity ,Relative Acceleration , Problems Plane Kinetics of Rigid Bodies ,-Translation s , - Rotation , Problems. [12hrs] Work and Energy REVIW SUMMARY. [18hrs]
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Learning and Teaching Strategies	
Strategies	A key strategy in delivering this module is to encourage participation in exercises while honing and extending students' critical thinking skills. This is accomplished through classroom instruction, interactive tutorials, and viewing of simple experiments with some sample activities that interest students.

Student Workload (SWL)

Structured SWL (h/sem)	93	Structured SWL (h/w)	6
Unstructured SWL (h/sem)	32	Unstructured SWL (h/w)	2
Total SWL (h/sem)	125		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Outcome	Learning
Formative assessment	Quizzes	2	10% (10)	5, 14	All	
	Assignments	2	10% (10)	2, 12	All	
	Projects / Lab.	1	10% (10)	Continuous	All	
	Report	1	10% (10)	10	All	
Summative assessment	Midterm Exam	2 hr	10% (10)	7	CLO-1-3	
	Final Exam	3hr	50% (50)	16	All	
Total assessment			100% (100 Marks)	-	-	

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Description of Motion Rectilinear Motion and plane motion Problems

Week 2	Projectiles Normal and Tangential Coordinates Motion (n-t) Problems
Week 3	Polar Coordinates Motion (r- θ) Relative Motion Problems
Week 4	Constrained Motion Newton's Second Law of Motion Problems
Week 5	Work and Energy Linear Impulse and Momentum Problems
Week 6	Mid Examine I
Week 7	Impacts Problems
Week 8	Plane Kinematics of Rigid Bodies Rotation, Angular Motion , Problems
Week 9	Absolute Motion Relative Velocity Problems
Week 10	Relative Velocity Rotation, Angular Motion Problems
Week 11	Instantaneous Center of Zero Velocity Relative Acceleration Problems
Week 12	Plane Kinetics of Rigid Bodies -Translation s - Rotation Problems
Week 13	Work and Energy
Week 14	Mid Examine II
Week 15	REVIW SUMMARY
Week 16	Final Examine

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Engineering Mechanics Dynamics, Mariam	Yes

Module

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average work
	C - Good	جيد	70 - 79	Sound work with minor errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major errors
	E - Sufficient	مقبول	50 - 59	Work meets minimum requirements
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark. 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic adjustment above.				

Description Catalogue وصف المادة الدراسية

MODULE DESCRIPTION FORM

● Engineering Mechanics – Statics

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Mechanics – Statics		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	UoN		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	1

Administering Department	MEER110	College	Type College Code
Module Leader	Dr. Rasheed N. Abed	e-mail	rasheed.n.abed@nahrainuniv.edu.iq
Module Leader's Acad. Title	Assist. Prof. Dr.	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Rasheed N. Abed	e-mail	rasheed.n.abed@nahrainuniv.edu.iq
Peer Reviewer Name	Dr. Rasheed N. Abed	e-mail	rasheed.n.abed@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Non e	Semester	
Co-requisites module	Non e	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of mechanics through the application of techniques. 2. To understand force, moment and equilibrium from analysis of force. 3. This course deals with the basic concept of force analysis for statics mechanisms. 4. This is the basic subject for all mechanics and static mechanics. 5. To understand forces analysis and equilibrium problems. 6. To perform analysis problems and structure analysis.
Module Learning Outcomes	

مخرجات التعلم للمادة الدراسية	1. Recognize how solve problems in mechanics analysis. 2. List the various terms associated with forces analysis. 3. Summarize what is meant by a basic force's analysis. 4. Discuss the reaction and forces of problems. 5. Describe forces, moment, and equilibrium. 6. Define forces law. 7. Identify the basic analysis elements and their applications. 8. Discuss the operations of solve and analysis in a mechanics problem 9. Discuss the various properties of forces, moments, and equilibrium. 10. Explain the mechanics laws used in force analysis. 11. Identify the forces and moments relationship with respect to analysis problems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Basic Concepts, Scalar and Vectors, Force system, 2D force system Rectangular Components, Moment & Couple, Resultants, Trusses, structure by methods of Joints & Sections, Frame Friction, Centroid, Area moment of inertia, Volume moment of inertia [15 hrs.] 3D Force system, 3D rectangular system, 3D moment, 3D couples, 3D resultant, Equilibrium in 2D Equilibrium in 3D [15 hrs.] Trusses, structure by methods of Joints & Sections, Frame Friction, [10 hrs.] Centroid, Area moment of inertia, Volume moment of inertia [15 hrs.] Revision problem classes [6 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The primary strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering types of simple analysis

	involving some enjoyable activities for the students to solve problems in mechanics.
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Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	9 3	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	5 7	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	3 hrs.	10% (10)	7	LO # 1-7
	Final Exam	3 hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
Week	Material Covered
Week 1	Basic Concepts, Scalar and Vectors, Scalar and Vectors
Week 2	Newton's Law, Law of gravity, Force system

Week 3	2D force system, Rectangular Components, Moment
Week 4	Mid Exam
Week 5	Couple, Resultants, 3D Force system, Resultants
Week 6	3D rectangular system, 3D moment, 3D couple
Week 7	3D resultant
Week 8	Equilibrium in 2D, Equilibrium in 3D
Week 9	Mid Exam
Week 10	Trusses structure by method of Joints
Week 11	Trusses structure by method of Sections
Week 12	Frame, Friction
Week 13	Centroid, Area moment of inertia
Week 14	Volume moment of inertia
Week 15	Final Exam
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Engineering Mechanics / Static by Beer	Yes
Recommended Texts	Engineering Mechanics by A. Higdon	No
Websites	Any videos or solution problems	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance

	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (فيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

● Mathematics I

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematics I		Module Delivery
Module Type	Basic learning activities		☐ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☒ Practical ☐ Seminar
Module Code	MATH110		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	

Administering Department	Mechanical Engineering	College	College of Engineering
Module Leader	Dr. Suhaib J. Shbailat	e-mail	suhaib.j.shbailat@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Non e	Semester	
Co-requisites module	Non e	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims اهداف المادة الدراسية	- To give the students the essential concepts in mathematics principles. - To understand Limit Functions - This course deals with derivatives functions (normal functions, trigonometric and inverse trigonometric functions, hyperbolic and inverse hyperbolic functions, exponential functions, and logarithmic functions. - To understand derivative application.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Review the principles general concepts of mathematics. - Understanding Limit Functions, Properties of limits, Important Limits, Limits involving infinity - Understanding the principles of Differentiation Rules and derivatives functions (normal functions, trigonometric and inverse trigonometric functions, hyperbolic and inverse hyperbolic functions, exponential functions, and logarithmic functions). - Develop the skills and analysis by learning the applications of differentiation such as Hopitals rule, the tangent and normal line, velocity and acceleration functions critical points and related rate. - Understanding the principles of integration of various functions (normal functions, trigonometric and inverse trigonometric functions, hyperbolic and inverse hyperbolic functions, exponential functions, and logarithmic functions). - Develop the skills and analysis by learning the methods of integration such as integration by part, integration by substitution, partial fraction integration.

	7. The applications of integration in finding the areas and volumes and curves length.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following; Introduction to Calculus, Cartesian and coordinates, Planes, Directions, Distance between points, Slope for straight line, Angle of inclination point slope equation, Slope intercept Equation Distance from point to the line, The Absolute Value, Even and Odd Functions, Domain and Range Functions [7 hrs.]. Trigonometric Functions, Inverse Trigonometric Functions, Logarithmic and exponential functions, Hyperbolic and Inverse hyperbolic functions [21 hrs.]. Limits and Continuity. [7hrs.] Revision problem classes [10 hrs.] Differentiation Rules and derivatives functions (normal functions, trigonometric and inverse trigonometric functions, hyperbolic and inverse hyperbolic functions, exponential functions, and logarithmic functions). [21 hrs.] Revision problem classes [10 hrs.] Differentiation Applications such as Hopitals rule, the tangent and normal line, velocity and acceleration functions critical points and related rate. [14 hrs.] Revision problem classes [10 hrs.] Antiderivative, Indefinite Integrals, Integrals of functions. [7 hrs.] Methods of Integration, integration by parts, substitutional, partial fraction, trigonometric substitution. [14 hrs.] Revision problem classes [10 hrs.] Integration applications such as areas by definite Integral, the length of plane curve, surface area, volume by Slicing and volume by Rotation about an axis. [14 hrs.] Revision problem classes [10 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to Improving the student's skill level encourage his participation in the exercises, while at the same time refining and expanding their critical thinking skills. in his study of mathematics, the student moves in particular from the stage of knowing something to the stage of practice and application, this will be achieved through classes, interactive tutorials and create special tests for each chapter of the course and develop introductory motivational questions for the next lesson.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	10 8	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	67	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	3,6, 9,12	LO #1, 2, 3,4,5 and6
	Assignments	5	10% (10)		LO #1, 2, 3,4,5 and6
	Projects / Lab.	5	10% (10)		LO #1, 2, 3,4,5 and6
	Report	1	10% (10)		LO #1, 2, 3,4,5 and6
Summative assessment	Midterm Exam	2 hrs.	10% (10)	7,14	LO # 2-9
	Final Exam	3hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Pre-Culculus
Week 2	Trigonometric and hyperbolic functions
Week 3	Derivatives of functions, Chain Rule and limits
Week 4	Engineering Applications
Week 5	Integration
Week 6	Integral Applications
Week 7	Exam 1
Week 8	Methods of Integration-1

Week 9	Methods of Integration-2
Week 10	Complex number
Week 11	Matrix
Week 12	Matrix operation
Week 13	Polar coordinates-1
Week 14	Polar coordinates-2
Week 15	Exam 2
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab, Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	I.Ford, S.R. and Ford, J.R. "Calculus" (1963) McGraw-Hill.	Yes

Recommended Texts	1. J.K.Back house and S.P.T. Houldsworth " Pure Mathematics a First Course " (1979) , S1 Edition , Longman Group 2. Advanced Engineering Mathematics, India Edition, Peter V. O Nel	No
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound works with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

● Mathematics II

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematics II		Module Delivery
Module Type	Core learning activity		• ☒ Theory • ☒ Lecture • ☐ Lab • ☒ Tutorial • ☐ Practical • ☐ Seminar
Module Code	MATH120		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	
Administering Department	Mechanical Engineering	College	2
Module Leader	Dr. Suhaib J. Shbailat	e-mail	College of Engineering
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	suhaib.j.shbailat@nahrainuniv.edu.iq
Module Tutor		e-mail	Ph.D.
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	08/06/2023	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MATH110	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To give the students the vector concepts in mathematics principles.

	2. To understand vector Functions 3. This course deals with directional derivatives 4. This course deals with D-operator and separation of variables 5. This course deals with double and triple integration 6. To understand engineering applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Give the principles of vector concepts of mathematics. 2. Understanding vector Functions, Properties of vectors in planes and lines 3. Understanding the principles of directional derivatives, gradient, D-operator and separation of variables 4. Develop the skills and analysis by learning the applications of engineering 5. Understanding the principles of double and triple integration of various functions 6. Develop the skills and analysis by learning the double integration in polar coordinates 7. The applications of integration in finding the areas and volumes and curves length.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to vector concepts of mathematics [7 hrs.]. Vector Functions, Properties of vectors in planes and lines[7hrs.] Revision problem classes [10 hrs.] Principles of directional derivatives, gradient [21 hrs.] Revision problem classes [10 hrs.] D-operator and separation of variables [14 hrs.] Revision problem classes [10 hrs.] Applications of engineering [14 hrs.]

	Revision problem classes [10 hrs.]
	Double and triple integration of various functions [10 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to Improving the student's skill level encourage his participation in the exercises, while at the same time refining and expanding their critical thinking skills. In his study of mathematics, the student moves in particular from the stage of knowing something to the stage of practice and application, this will be achieved through classes, interactive tutorials and create special tests for each chapter of the course and develop introductory motivational questions for the next lesson.

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	9 3	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	5 7	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2.2 8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	3, 6	LO #1, 2, and 3
	Assignments	5	10% (10)	2, 12	LO # 3, and 6
	Projects / Lab.	5	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 3, and 5

Summative assessment	Midterm Exam	2 hrs.	10% (10)	7	LO # 1-5
	Final Exam	3 hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Vector algebra
Week 2	Vector in planes and lines
Week 3	Vector functions
Week 4	Directional derivatives
Week 5	Engineering applications
Week 6	D-operator method and separation of variables
Week 7	Mid-term Exam
Week 8	Double integration
Week 9	Change of order
Week 10	Double integration in polar coordinates
Week 11	Engineering applications
Week 12	Engineering applications
Week 13	Cartesian triple integration
Week 14	Applications
Week 15	Mid exam 2
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources
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مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Linear Algebra with Applications Sadiku, Steven J. Leon University of Massachusetts, Dartmouth , Pearson	Yes
Recommended Texts	The Student's Introduction to Mathematica , Bruce F. Torrence	No
Websites	https://classroom.google.com/c/NDAYMDk3MDc1NzQ1	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C –Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Workshop</u>		Module Delivery	
Module Type			☐ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	<u>WORK140</u>			
ECTS Credits				
SWL (hr/sem)				
Module Level	1	Semester of Delivery		1
Administering Department	Mechanical Engineering	College	College of Engineering	
Module Leader	Abdulhakeem Amer Salman		e-mail	abdulhakeem.a.salman@nahrainuniv. u.iq
Module Leader's Acad. Title	Lecturer assistant	Module Leader's Qualification	MS.c.	
Module Tutor	Name (if available)	e-mail	E-mail	
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	01/06/2024	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Provide students with the fundamental technical knowledge and skills in workshop to recognize, analyze and solve problems, and to apply these abilities to the generation of new knowledge, ideas or products in industry.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Explain the use of measuring and bench fitting tools. 2. Show the use of safety equipment during workshop practice. 3. Knowledge and understanding the use of different tools. 4. Describe the basic concepts of different types of welding. 5. Display the ability to use different basic machining operations keeping all safety precautions in mind.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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Module Evaluation

تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
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Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Principles of safety in workshop and laboratories
Week 2	Machining process
Week 3	Machining process
Week 4	Sheet metal forming
Week 5	Sheet metal forming
Week 6	Welding process
Week 7	Welding process
Week 8	Electricity
Week 9	Electricity
Week 10	Electricity
Week 11	Machining process
Week 12	Machining process
Week 13	Carpentry

Week 14	Carpentry
Week 15	Final Examine

Delivery Plan (Weekly Lab. Syllabus)		
المنهاج الاسبوعي للمختبر		
	Material Covered	
Week 1		
Week 2		
Week 3		
Week 4		
Week 5		
Week 6		
Week 7		
Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		Yes
Recommended Texts		No
Websites		

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition

Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Course Description Form

● Course Name:	
Engineering Drawing	
● Course Code:	
CREQ 110	
● Semester / Year:	
2 / 2023 - 2024	
● Description Preparation Date:	
2024 -4-1	
● Available Attendance Forms:	
Full Time	
● Number of Credit Hours (Total) / Number of Units (Total)	
175 SWL (hr/sem) / 7 ECTS Credits	
● Course administrator's name (mention all, if more than one name)	
Name: Mohammed DuraidHamdey Email: mohammed.du.hamdey@nahrainuniv.edu.iq	
● Course Objectives	
Course Objectives	1.This course deals with the basic concept of engineering drawing. 2.Understanding of concepts, tools and

	methods of engineering drawing. 3.To provide participants with basic theoretical and practical skills to produce engineering drawings. 4.Introduce students to AutoCAD software requirements. 5.To introduce the students, the techniques constructing the various types of polygons, curves and scales				
● Teaching and Learning Strategies					
Strategy	1.Apply the correct principle to produce engineering drawing 2.Construct engineering drawing precisely . 3.Complete engineering drawing correctly by manual and AutoCAD application. 4.Ability to read and prepare engineering drawing 5.Ability to make freehand sketching 6.Power of imagine, analyze and communicate 7.Capacity to understand other subjects 8.Computer aided design or drafting provides powerful tools for drafting, design and manufacture, drawing regulation .				
● Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	7	GO-1: An ability to identify , formulate , and solve complex engineering problems by applying principles of engineering , science, and mathematics.	Introduction	Analysis	Tutorial ,CW. HW, Quiz
2	7	GO-1: An ability to identify , formulate , and solve complex engineering problems by applying principles of engineering , science, and mathematics.	Line types	Analysis	Tutorial , HW, Quiz
3	7	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social ,	Fundamentals of engineering operations	Analysis	Tutorial , HW, Quiz

		environmental , and economic factors.			
4	7	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	Practical examples	Analysis	Tutorial , HW, Quiz
5	7	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	Engineering Drawing	Analysis	Tutorial , HW, Quiz
6	7	GO-3: An ability to communicate effectively with a range of audiences.	processes	Analysis	Tutorial , HW, Quiz
7	7	GO-3: An ability to communicate effectively with a range of audiences.	Mid Exam.1	Analysis	Tutorial , HW, Quiz
8	7	GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Views and projections	Analysis	Tutorial , HW, Quiz
9	7	GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Dimensions	Analysis	Tutorial , HW, Quiz
10	7	GO-5: An ability to function effectively on a	Three-dimensional drawing (Isometric)	Analysis	Tutorial , HW, Quiz

		team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.			
11		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Exam.2	Analysis	Tutorial , HW, Quiz
12		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Sections and Model work examples	Analysis	Tutorial , HW, Quiz
13		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	shortest distance from a point to a line in space	Analysis	Tutorial , HW, Quiz
14		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Intersections of plane	Analysis	Tutorial , HW, Quiz
15		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Mid Exam .2	Analysis	Tutorial , HW, Quiz
Course Evaluation					
Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Abdul Rasoul Al-Khafaf/ Part One		
Main references (sources)					
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					

Course Description Form

Course Name:
Fluid mechanics

Course Code:					
MEER212					
Semester / Year:					
First Semester/2023-2024					
Description Preparation Date:					
April 2024					
Available Attendance Forms:					
April 2024					
Number of Credit Hours (Total) / Number of Units (Total)					
3 hours per week / 2 units					
Course administrator's name (mention all, if more than one name)					
Name: Prof. Dr. Ahmed Waheed Mustafa, Asst. Prof. Dr. Ansam Adil Mohammed Email: ansam.a.mohammed@nahrainuniv.edu.iq					
Course Objectives					
Course Objectives			- Introduce the student about the details and fluid state and then starts steps by step - Explaining fluid dynamic section in addition for examining the application of both fields.		
Teaching and Learning Strategies					
Strategy		Introduce the student about the details and fluid state and then starts steps by step explaining fluid dynamic section in addition for examining the application of both fields.			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	CLO-1: Explain the key fluid properties used in the analysis of fluid behavior.	Fluid and their Properties	Analysis	Tutorial , HW, Quiz
2-3	6	CLO-1: Explain the key fluid properties used in the analysis of fluid behavior	Fluid Static's	Analysis	Tutorial , HW, Quiz

4-5	6	CLO-2: Compute the pressure and hydrostatic pressure force at various locations in a fluid.	Fluid in Motion	Analysis	Tutorial , HW, Quiz
6	3	CLO-3: Apply the Bernoulli, continuity and energy equations to solve simple fluid flow problems.	Bernoulli's Equation	Analysis	Tutorial , HW, Quiz
7	3	CLO-3: Apply the Bernoulli, continuity and energy equations to solve simple fluid flow problems.	Application of Bernoulli's Equation	Analysis	Tutorial , HW, Quiz
8	3	Analyze different fluid flow models using finite control volume and differential analysis approaches.	Continuity and Energy Equations	Analysis	Tutorial , HW, Quiz
9	3	Analyze different fluid flow models using finite control volume and differential analysis approaches.	Application of Energy Equation	Analysis	Tutorial , HW, Quiz
10	3	Analyze different fluid flow models using finite control volume and differential analysis approaches.	Momentum Principle	Analysis	Tutorial , HW, Quiz

• Course Evaluation

Tests: 5%

Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade.

Assignments: (5%)

There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade.

Examinations

There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator.

Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook.

Mid-Semester Exam: (15%)(15+15)

Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9 . The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade.

Final Exam: (60%)

Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER212. The exam is worth 50% of the final grade.

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Fluid Mechanics, Roberson.
Main references (sources)	Fluid Mechanics, Massey.
Recommended books and references (scientific journals, reports...)	Fluid Mechanics Fox.
Electronic References, Websites	www.google.com

Course Description Form

Course Name:	
Fluid mechanics II	
Course Code:	
MEER222	
Semester / Year:	
Second Semester/2023-2024	
Description Preparation Date:	
April 2024	
Available Attendance Forms:	
Full Time	
Number of Credit Hours (Total) / Number of Units (Total)	
5 hours per week / 3 units	
Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Ahmed Waheed Mustafa, Asst. Prof. Dr. Ansam Adil Mohammed Email: ansam.a.mohammed@nahrainuniv.edu.iq	
Course Objectives	
Course Objectives	Introduce the student about the details and fluid state and then starts steps by step

			Explaining fluid dynamic section in addition for examining the application of both fields.		
Teaching and Learning Strategies					
Strategy		Introduce the student about the details and fluid state and then starts steps by step explaining fluid dynamic section in addition for examining the application of both fields.			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	CLO-1: Explain the key fluid properties used in the analysis of fluid behavior.	Shear distrubutiom	Analysis	Tutorial , HW, Quiz
2-3	6	CLO-1: Explain the key fluid properties used in the analysis of fluid behavior	Losses in pipe	Analysis	Tutorial , HW, Quiz
4-5	6	CLO-2: Compute the pressure and hydrostatic pressure force at various locations in a fluid.	orifice	Analysis	Tutorial , HW, Quiz
6	3	CLO-3: Apply the Bernoulli, continuity and energy equations to solve simple fluid flow problems.	Venture meter	Analysis	Tutorial , HW, Quiz
7	3	CLO-3: Apply the Bernoulli, continuity and energy equations to solve simple fluid flow problems.	noozle	Analysis	Tutorial , HW, Quiz
8	3	Analyze different fluid flow models using finite control volume and differential analysis approaches.	Reynolds no.	Analysis	Tutorial , HW, Quiz
9	3	Analyze different fluid flow models using finite control volume and differential analysis approaches.	Water Hammer	Analysis	Tutorial , HW, Quiz
10	3	Analyze different fluid flow models using finite control volume and differential analysis approaches.	Dimensional analysis	Analysis	Tutorial , HW, Quiz

Course Evaluation	
Tests: 5% Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade. Assignments: (5%) There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade. Examinations There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook. Mid-Semester Exam: (15%)(15+15) Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9 . The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade. Final Exam: (60%) Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER212. The exam is worth 50% of the final grade.	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Fluid Mechanics, Roberson.
Main references (sources)	Fluid Mechanics, Massey.
Recommended books and references (scientific journals, reports...)	Fluid Mechanics Fox.
Electronic References, Websites	www.google.com

Course Description Form

Course Name:
Mechanics of Material
Course Code:
MEER210
Semester / Year:
First semester / second year
Description Preparation Date:
2023/2024
Available Attendance Forms:
Second year students

Number of Credit Hours (Total) / Number of Units (Total)					
3/3					
Course administrator's name (mention all, if more than one name)					
Name: Dr.Hala Salman Hasan Email: halasalman2006@yahoo.com Name: Dr.Salsabilkareemmohammed Email: salsabil2alanber@gmail.com					
Course Objectives					
Course Objectives student can understand the meaning of stress and strain , ty of stresses (tension , compression and shear), stresses in bea bending stress and shear stress), shear stress in circular bars to torsion , stress in thin –walled pressure vessels(cylinder spherical)					
Teaching and Learning Strategies					
Strategy		On successful completion of this course students will be able to: 1. CLO-1: Demonstrate an understanding of the concepts of stress and strain, and the stress-strain relationships for homogenous, isotropic materials. 2. CLO-2: Demonstrate an understanding of the relationships between axial loads, shear loads, torsion load and strain, and thin-walled pressure vessels. 3. CLO-3: Demonstrate an understanding of thermal stresses and resultant deformation. 4. CLO-4: Apply the above understanding to the designs and analysis of structural members based strength and deformation criteria. 5. CLO-5 Demonstrate an understanding of the assumptions and limitations of the theories used in mechanics of materials. CLO-6 Demonstrate competence in problem identification, formulation and solution, and thinking. Continuous assessment Tests (Quizzes) Examinations (Mids and final)			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2	3 3	CLO-1: Demonstrate an	Simple stress strain, basic loadings	Lectures +examples	Tutorials +discussion

		understanding of the concepts of stress and strain, and the stress-strain relationships for homogenous, isotropic materials. CLO-2: Demonstrate an understanding of the relationships between axial loads, shear loads, torsion load and strain, and thin-walled pressure vessels. CLO-3: Demonstrate an understanding of thermal stresses and resultant deformation. CLO-4: Apply the above understanding to the designs and analysis of structural members based on strength and deformation criteria. CLO-5 Demonstrate an understanding of the assumptions and limitations of the theories used in mechanics of materials. CLO-6 Demonstrate competence problem identification, formulation solution, critical thinking	Stress-strain relation ships	Lectures +examples	Tutorials +discussione
3	3		Thermal stress	Lectures +examples	Tutorials +discussione
4	3		Thermal stress	Lectures +examples	Tutorials +discussione
5	3		Shear force bending moment diagram	Lectures +examples	Tutorials +discussione
6	3		Mid exam 1	Lectures +examples	Tutorials +discussione
7	3		Shear force bending mom diagram	Lectures +examples	Tutorials +discussione
8	3		Bending stres in beam	Lectures +examples	Tutorials +discussione
9	3		Shearing stres in beam	Lectures +examples	Tutorials +discussione
10	3		Shearing stres in beam + exam	Lectures +examples	Tutorials +discussione
11	3		Torsion of circ bar	Lectures +examples	Tutorials +discussione
12	3		Torsion of circ bar	Lectures +examples	Tutorials +discussione
13 14	3 3		Exam 3	Lectures +examples	Tutorials +discussione
			Thin wa pressure vessel	Lectures +examples	Tutorials +discussione
15	3		Thin wa pressure vessel	Lectures +examples	Tutorials +discussione

Course Evaluation (eg. type, weightings, schedule of assessments – demonstrating how the Assignments: 5% There will be assessment for the student performance through the whole course mainly questioning and discussing, this assessment worth 5% of the final grade. Tests: (30% (10+10+10)) Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned (30%) of the final grade. Assignments: (%) There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week (1) to Week (15). The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth Week (2.5) of the final grade. Examinations: (%) There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to the student handbook. Mid-Semester Exam: (30%) Mid-Semester exam will be held in Week (8). The mid-semester exam will examine material covered from Week (1) to Week (7). The mid-Semester exam is worth 30% of the final grade. Final Exam: (60%) Final exam will be held during the final examination period. The exam paper will test all the lectures covered in (Course Code). The exam is worth 60% of the final grade.					
Learning and Teaching Resources					
Required textbooks (curricular books, if any)				Strength of materials by singer	
Main references (sources)				Strength of materials by singer	

Recommended books and references (scientific journals, reports...)	Mechanics of material by E.J.HEARN
Electronic References, Websites	

Course Description Form

• Course Name:	
Mechanics of Material 2	
• Course Code:	
MEER220	
• Semester / Year:	
second semester /second year	
• Description Preparation Date:	
2023/2024	
• Available Attendance Forms:	
Second year students	
• Number of Credit Hours (Total) / Number of Units (Total)	
5/3	
• Course administrator's name (mention all, if more than one name)	
Name: Dr.Hala Salman Hasan Email: halasalman2006@yahoo.com Name: Dr.Salsabilkareemmohammed Email: salsabil2alanber@gmail.com	
• Course Objectives	
Course Objectives student can understand the meaning of stress and strain , types of stresses (tension , compression and shear), stresses in beams	• •

(bending stress and shear stress), shear stress in circular bars due to torsion , stress in thin –walled pressure vessels(cylinder and spherical)			•		
• Teaching and Learning Strategies					
Strategy	On successful completion of this course students will be able to: 6. CLO-1: Demonstrate an understanding of the concepts of stress and strain, and the stress-strain relationships for homogenous, isotropic materials. 7. CLO-2: Demonstrate an understanding of the relationships between axial loads, shear loads, torsion load and strain, and thin-walled pressure vessels. 8. CLO-3: Demonstrate an understanding of thermal stresses and resultant deformation. 9. CLO-4: Apply the above understanding to the designs and analysis of structural members based on strength and deformation criteria. 10. CLO-5 Demonstrate an understanding of the assumptions and limitations of the theories used in mechanics of materials. CLO-6 Demonstrate competence in problem identification, formulation and solution, and critical thinking. Continuous assessment Tests (Quizzes) Examinations (Mids and final)				
• Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	CLO-1: Demonstrate an understanding of the concepts of stress and strain, and the stress-strain relationships for homogenous, isotropic materials.	Simple stress and	Lectures +examples +lab.	Tutorials
2	5		strain, basic loadings	Lectures +examples +lab	+discussiones
			Stress-strain relation ships	Lectures +examples +lab	Tutorials +discussiones
3	5		Thermal stresses	Lectures +examples +lab	Tutorials +discussiones
4	5		Thermal stresses	Lectures +examples	Tutorials +discussiones

		CLO-2: Demonstrate an understanding of the relationships between axial loads, shear loads, torsion load and strain, and thin-walled pressure vessels. CLO-3: Demonstrate an understanding of thermal stresses and resultant deformation. CLO-4: Apply the above understanding to the designs and analysis of structural members based on strength and deformation criteria. CLO-5 Demonstrate and understanding of the assumptions and limitations of the theories used in mechanics of materials. CLO-6 Demonstrate competence in problem		+lab	
5	5		Shear force and bending moment diagram	Lectures +examples +lab	Tutorials +discussiones
6	5		Mid exam 1	Lectures +examples +lab	Tutorials +discussiones
7	5		Shear force and bending moment diagram	Lectures +examples +lab	Tutorials +discussiones
8	5		Bending stresses in beam	Lectures +examples +lab	Tutorials +discussiones
9	5		Shearing stresses in beam	Lectures +examples +lab	Tutorials +discussiones
10	5		Shearing stresses in beam + exam2	Lectures +examples +lab	Tutorials +discussiones
11	5		Torsion of circular bar	Lectures +examples +lab	Tutorials +discussiones
12	5		Torsion of circular bar	Lectures +examples +lab	Tutorials +discussiones
13 14	5		Exam 3	Lectures +examples +lab	Tutorials +discussiones
			Thin walled pressure vessel	Lectures +examples +lab	Tutorials +discussiones
15	5		Thin walled pressure vessel	Lectures +examples +lab	Tutorials +discussiones

		identification, formulation solution, and critical thinking.			
Course Evaluation					
(eg. type, weightings, schedule of assessments – demonstrating how the Assignments: 5% There will be assessment for the student performance through the whole course mainly by questioning and discussing, this assessment worth 5% of the final grade. Tests: (20% (10+10)) Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned (20%) of the final grade. Assignments: (%) There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week (1) to Week (15). The assignments' purpose is to gain experience and understanding of management information systems. Each assignment is worth Week (2.5) of the final grade. Examinations: (%) There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook. Mid-Semester Exam: (20%) Mid-Semester exam will be held in Week (8). The mid-semester exam will examine material covered from Week (1) to Week (7). The mid-Semester exam is worth 20% of the final grade. Lab evaluations (15 %) Discussion exam and reports Final Exam: (60%) Final exam will be held during the final examination period. The exam paper will test all the lectures covered in (Course Code). The exam is worth 60% of the final grade.					

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Strength of materials by singer
Main references (sources)	Strength of materials by singer
Recommended books and references (scientific journals, reports...)	Mechanics of material by E.J.HEARN
Electronic References, Websites	

Course Description Form

Course Name:					
Metallurgy					
Course Code:					
MEER215					
Semester / Year:					
First Semester/2023-2024					
Description Preparation Date:					
April 2024					
Available Attendance Forms:					
Full Attendance					
Number of Credit Hours (Total) / Number of Units (Total)					
2 CL (hr/w) 3 units 2 Lab (hr/w)					
Course administrator's name (mention all, if more than one name)					
Name: Prof. Dr. Ayad Murad Takhakh, Lecturer. Dr. Samer Jasim Mahmood Email: samer.j.mahmoud@nahrainuniv.edu.iq					
Course Objectives					
Course Objectives		This course aims to introduce the fundamental of materials science including the relationship between the structure of materials at atomic or molecular scale and their macroscopic properties, the solidification of pure metals, solidification of alloys. The course also provides a conceptual framework for understanding the classification of engineering materials and their properties. Study the Metallography – preparation of specimen and study of mounting. Study of microstructure of steel. Study of microstructure of cast iron. Study of microstructure of Non-ferrous alloys.			
Teaching and Learning Strategies					
Strategy		The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2	Crystalline Structure of Metals	Crystalline Structure of Metals	Lecture	Discusstion
2	2	Solidification	Solidification	Lecture videos	Quiz
3	2	Equilibrium and Phase Diagram	Equilibrium and Phase Diagram	Lecture videos	Discusstion
4	2	Equilibrium and Phase Diagram	Equilibrium and Phase Diagram	Lecture videos	Quiz
5	2	Solid Solutions	Solid Solutions	Lecture videos	Discusstion
6	2	Iron-Carbon Equilibrium Diag.	Iron-Carbon Equilibrium Diag.	Lecture videos	Quiz
7	2	Mid Examine \1	Mid Examine \1		Discusstion
8	2	Phase Transformations	Phase Transformations	Lecture	Quiz
9	2	Ferrous alloys	Ferrous alloys	Lecture	Discusstion
10	2	Steel	Steel	Lecture	Quiz
11	2	Cast Iron	Cast Iron	Lecture	Discusstion
12	2	Heat Treatment of Steel	Heat Treatment of Steel	Lecture videos	Discusstion
13	2	Non-Ferrous alloys	Non-Ferrous alloys	Lecture videos	Mid Exam / 1
14	2	Non-Ferrous alloys	Non-Ferrous alloys	Discussion	Discusstion
15	2	Mid Examine \2	Mid Examine \2	Discussion	Quiz
Course Evaluation					
Tests and home work: 5% Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade. Lab: (15%) The Lab will be based on running case study for material covered during the course Mid-Semester Exam: (10%)(10+10) Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 15 . The mid-semester exam will examine material covered from Week 1 to Week 6. Final Exam: (60%)					

• Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Engineering Metallurgy Vol. I And II , R.A.Higgins (ELBS)
Main references (sources)	Engineering Metallurgy Vol. I And II , R.A.Higgins (ELBS)
Recommended books and references (scientific journals, reports...)	FUNDAMENTALS OF MODERN MANUFACTURING Materials, Processes, and Systems Fourth Edition Mikell P. Groover
Electronic References, Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering

Course Description Form

• Course Name:	
Thermodynamics II	
• Course Code:	
MEER223	
• Semester / Year:	
second Semester / second Year	
• Description Preparation Date:	
1/9/2023 (2023-2024)	
• Available Attendance Forms:	
Compulsory attendance	
• Number of Credit Hours (Total) / Number of Units (Total)	
45 / 2	
• Course administrator's name (mention all, if more than one name)	
Name: Dr. Raad K. Mohammed AL-Dulaimi Email: raad.k.mohammed@nahrainuniv.edu.iq	
Name: Lec. Mazin Yahya Abdulkareem Email: mazin.y.abdulkareem@nahrainuniv.edu.iq	
• Course Objectives	
This course deals with the second law statements, reversible and irreversible processes, the Carnot cycle principles, entropy, the increase of entropy principle, the T-S diagram, isentropic process & entropy balance, thermodynamics cycles, gas power cycles, vapor power cycles, refrigerators, and heat pumps.	

• Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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• Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
15	45	1. Ability to understand the basic concepts of second law thermodynamics. 2. The ability to understand reversible and irreversible processes, and the principles of the Carnot cycle. 3. The ability to understand the property of entropy, the processes of isentropy, generated entropy, and entropic equilibrium. 4. Apply the second law of thermodynamics to thermodynamic cycles such as gas power cycles, steam power cycles, refrigerators, and heat pumps.	Thermodynamics II	Lectures Lab Sessions Tutorials	Tests. Assignments. Examinations. Mid-Semester Exam. Final Exam:

• Course Evaluation

Tests:(10%)

Assignments:(10%) Examinations. :(10%) Mid-Semester Exam:(10%). Final Exam: :(60%)	
• Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Yunus A. Çengel, Michael A. Boles; Thermodynamics: An Engineering Approach, Eighth Edition; Published by McGraw-Hill Education
Recommended books and references (scientific journals, reports...)	Michael J. Moran, Howard N. Shapiro, Daisie D. Boettner, Margaret B. Bailey; Fundamentals of Engineering Thermodynamics, Eighth Edition; WILEY.
Electronic References, Websites	

Course Description Form

• Course Name:
Thermodynamics I
• Course Code:
MEER213
• Semester / Year:
First Semester / second Year
• Description Preparation Date:
1/9/2023 (2023-2024)
• Available Attendance Forms:
Compulsory attendance
• Number of Credit Hours (Total) / Number of Units (Total)
75 / 3
• Course administrator's name (mention all, if more than one name)
Name: Dr. Raad K. Mohammed AL-Dulaimi Email: raad.k.mohammed@nahrainuniv.edu.iq
Name: Lec. Mazin Yahya Abdulkareem Email: mazin.y.abdulkareem@nahrainuniv.edu.iq

● Course Objectives

This course deals with the fundamentals of Thermodynamics including thermodynamic systems and properties, relationships among the thermodynamic properties, the laws of thermodynamics and applications of these basic laws in thermodynamic systems. This course will provide the essential tools required to study thermodynamic systems in Applied Thermodynamics

● Teaching and Learning Strategies

Strategy

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

● Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
15	75	After successful completion of this course the students will be able to: 1. Ability to understand the basic concepts of thermodynamic such as temperature, pressure, system, properties, process, state, cycles and equilibrium. 2. Ability to conduct experiments regarding the measurement and calibration of temperatures and pressures in groups. 3. Ability to identify the properties of substances on property diagrams and obtain the data from property tables 4. Ability to define energy transfer through mass, heat and work for closed and control volume systems. 5. Ability to apply the first Law of	Thermodynamics I	Lectures Lab Sessions Tutorials	Tests. Assignments. Examinations. Mid-Semester Exam. Final Exam:

		Thermodynamics on closed and control volume systems. 6. Apply the first law thermodynamics for control volume, include with turbines, compressors, nozzles, diffusers, heat exchangers, and throttling devices.			
● Course Evaluation					
Tests:(5%) Assignments:(15%) Examinations. :(5%) Mid-Semester Exam:(15%). Final Exam: :(60%)					
● Learning and Teaching Resources					
Required textbooks (curricular books, if any)					
Main references (sources)			Yunus A. Çengel, Michael A. Boles; Thermodynamics: An Engineering Approach, Eighth Edition; Published by McGraw-Hill Education		
Recommended books and references (scientific journals, reports...)			Michael J. Moran, Howard N. Shapiro, Daisie D. Boettner, Margaret B. Bailey; Fundamentals of Engineering Thermodynamics, Eighth Edition; WILEY.		
Electronic References, Websites					

Course Description Form

Course Name:					
Electrical Machine					
Course Code:					
MEER312					
Semester / Year:					
First Semester/2023-2024					
Description Preparation Date:					
April 2024					
Available Attendance Forms:					
April 2024					
Number of Credit Hours (Total) / Number of Units (Total)					
2 hours per week / 3 units					
Course administrator's name (mention all, if more than one name)					
Name: assit lecture shmoos.rahem Email: shmoos.rahem@nahrainuniv.edu.iq					
Course Objectives					
Course Objectives			Introduce the student about the electrical machines and the relation between magnetism and electricity and the type of D.C machines.		
Teaching and Learning Strategies					
Strategy		Introduce the student about the details of electrical machine and introduce the equation of motion and how to drive it .			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2	CLO-1: explain the relation between magnetism and electricity.	Relation Between magnetism and Electricity	Tutorial	Tutorial, HW, Quiz
2-3	2	CLO-1: Explain the induced of EMF	Production of induced EMF and current	Tutorial	Tutorial, HW, Quiz
4-5	2	CLO-2: Compute How to drive faraday law.	Faraday's law	Tutorial	Tutorial , HW, Quiz
6	2	CLO-3: Apply the motor principle and comparison between generator and motor.	Motor Principle & comparison of generator and motor action	Tutorial	Tutorial, HW, Quiz
7	2	CLO-3: Apply the simplex lap and wave winding.	Simplex lap and wave windings	Tutorial	Tutorial, HW, Quiz
8	2	Analyze and drive the equation of EMF.	Generated EMF Equation of generator	Tutorial	Tutorial, HW, Quiz
9	2	Analyze generator.	Generator Principle & Simple Loop Generator	Analysis	Tutorial , HW, Quiz
10	3	Analyze types of generators.	Types of generators	Analysis	Tutorial , HW, Quiz

• Course Evaluation

Tests: 5%

Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade.

Assignments: (5%)

There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade.

Examinations

There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook.

Mid-Semester Exam: (15%)(15+15)

Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9 . The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade.

Final Exam: (60%)

Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER212. The exam is worth 50% of the final grade.

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Electrical Technology Volume 2 ,IN S.I.UNITS(AC and DC Machine)
Main references (sources)	Electrical machine and drives Jan A.Melkebeek
Recommended books and references (scientific journals, reports...)	Electrical machines Lon Boldea Luian N.Tutelea
Electronic References, Websites	www.google.com

Course Description Form

Course Name:	
Mechanics of machines I	
Course Code:	
MEER315	
Semester / Year:.	
First Semester/2023-2024	
Description Preparation Date:	
April 2024	
Available Attendance Forms:	
Full Time	
Number of Credit Hours (Total) / Number of Units (Total)	
3 hours per week / 3 units	
Course administrator's name (mention all, if more than one name)	
Name: Dr. Nadhim Naseer Email: nadhim.na.nadhim@nahrainuniv.edu.iq	
Course Objectives	
Course Objectives	- Apply the necessary mathematical tools to analysis machines parts - Demonstrate the ability to read, evaluate and interpret machines performance - Understand the kinematics of machines parts and analyze the faults analytically
Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are

interesting to the students.					
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	GO-1: An ability to identify , formulate , and solve complex engineering problems by applying principles of engineering , science, and mathematics.	Introduction-Structure and Classification of Mechanism, Relative Speed, acceleration in Mechanisms	Analysis	Tutorial , HW, Quiz
2	6	GO-1: An ability to identify , formulate , and solve complex engineering problems by applying principles of engineering , science, and mathematics.	Velocity Diagram and Acceleration Diagram.	Analysis	Tutorial , HW, Quiz
3	6	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	Gear train, Spur Gears, Epicyclical Gears,	Analysis	Tutorial , HW, Quiz
4	3	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	Epicyclical Gears,	Analysis	Tutorial , HW, Quiz
5	3	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	Introduction to Friction application in Machines,	Analysis	Tutorial , HW, Quiz
6	3	GO-3: An ability to communicate effectively with a range of audiences.	Followers.Types ,Analysis.	Analysis	Tutorial , HW, Quiz
7	3	GO-3: An ability to communicate effectively	Mid Exam.1	Analysis	Tutorial , HW, Quiz

		with a range of audiences.			
8	3	GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Problems	Analysis	Tutorial , HW, Quiz
9		GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Introduction to Cam Profiles,	Analysis	Tutorial , HW, Quiz
10		GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Introduction to Balancing of Machines, Static and dynamic Balancing,	Analysis	Tutorial , HW, Quiz
11		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Reciprocating Balancing.	Analysis	Tutorial , HW, Quiz
12		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Mid Exam .2	Analysis	Tutorial , HW, Quiz
13		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Introduction to Syntheses of Mechanisms	Analysis	Tutorial , HW, Quiz
14		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Introduction to Vehicle Dynamics,	Analysis	Tutorial , HW, Quiz
15		GO-7:An ability to acquire and apply new knowledge as needed,	Review	Analysis	Tutorial , HW, Quiz

		using appropriate learning strategies			
Course Evaluation					
Tests: 5% Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade. Assignments: (5%) There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade. Examinations There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook. Mid-Semester Exam: (15%)(15+15) Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9 . The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade. Final Exam: (60%) Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER315. The exam is worth 50% of the final grade.					
Learning and Teaching Resources					
Required textbooks (curricular books, if any)			- Theory of Machines, Khurmi, R. et al. ; - Vehicle Dynamics:		
Main references (sources)			Theory and Application, Reza N. Jazar		
Recommended books and references (scientific journals, reports...)			Mechanics of Machines) by Hannah		
Electronic References, Websites			www.google.com/ theory of machine		

Course Description Form

Course Name:
Mechanics of machines II
Course Code:
MEER324
Semester / Year:.
Second Semester/2023-2024
Description Preparation Date:
April 2024
Available Attendance Forms:
Full Time
Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 2units

Course administrator's name (mention all, if more than one name)					
Name: Dr. Nadhim Naseer Email: nadhim.na.nadhim@nahrainuniv.edu.iq					
Course Objectives					
Course Objectives	Apply the necessary mathematical tools to analysis machines parts Demonstrate the ability to read, evaluate and interpret machines performance Understand the kinematics of machines parts and analyze the faults analytically				
Teaching and Learning Strategies					
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.				
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	GO-1: An ability to identify , formulate , and solve complex engineering problems by applying principles of engineering , science, and mathematics.	Belts	Analysis	Tutorial , HW, Quiz
2	6	GO-1: An ability to identify , formulate , and solve complex engineering problems by applying principles of engineering , science, and mathematics.	Flywheels	Analysis	Tutorial , HW, Quiz
3	6	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	Brakes	Analysis	Tutorial , HW, Quiz
4	3	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as	Types ,Analysis	Analysis	Tutorial , HW, Quiz

		global , cultural , social , environmental , and economic factors.			
5	3	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	Problems	Analysis	Tutorial , HW, Quiz
6	3	GO-3: An ability to communicate effectively with a range of audiences.	1 st Mid Exam.	Analysis	Tutorial , HW, Quiz
7	3	GO-3: An ability to communicate effectively with a range of audiences.	Clutches	Analysis	Tutorial , HW, Quiz
8	3	GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Types ,Analysis	Analysis	Tutorial , HW, Quiz
9		GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Clutches calculations	Analysis	Tutorial , HW, Quiz
10		GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Problems	Analysis	Tutorial , HW, Quiz
11		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Governors,	Analysis	Tutorial , HW, Quiz

12		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Types ,Analysis.	Analysis	Tutorial , HW, Quiz
13		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Planetary Gears	Analysis	Tutorial , HW, Quiz
14		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Mid Exam .2	Analysis	Tutorial , HW, Quiz
15		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Review	Analysis	Tutorial , HW, Quiz
Course Evaluation					
Tests: 5% Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade. Assignments: (5%) There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade. Examinations There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook. Mid-Semester Exam: (15%)(15+15) Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9 . The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade. Final Exam: (60%) Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER324. The exam is worth 50% of the final grade.					
Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Theory of Machines, Khurmi, R. et al. ; Vehicle Dynamics:		
Main references (sources)			Theory and Application, Reza N. Jazar		
Recommended books and references (scientific journals, reports...)			Mechanics of Machines) by Hannah		
Electronic References, Websites			www.google.com/ theory of machine		

Course Description Form

● Course Name:	
Industrial Engineering	
● Course Code:	
MEER312	
● Semester / Year:	
3 rd year / 1 st Semester	
● Description Preparation Date:	
2023_2024	
● Available Attendance Forms:	
Third year students	
● Number of Credit Hours (Total) / Number of Units (Total)	
30 hrs/ 2 units	
● Course administrator's name (mention all, if more than one name)	
Name: Dr.Hala Salman Hasan Email: halasalman2006@yahoo.com	
● Course Objectives	
Course Objectives	- GO-1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. - GO-3: An ability to communicate effectively with a range of audiences. - GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. - GO-7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
● Teaching and Learning Strategies	
Strategy	On successful completion of this course students will be able to: - CLO-1: Be aware of the global economy and the international aspects of business. - CLO-2: Understand principles and processes of quality management (cost of quality, continuous improvement, etc.) - CLO-3: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

		4. CLO-4: Be able to manage projects, time, financials, and people effectively and efficiently 5. CLO-5: Use team skills such as leadership, followership and human relations to work effectively in a team environment. 6. CLO-6: Be able to solve technical problems using empirical and analytical methods.			
● Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2hrs each	CLO-1: Be aware of the global economy and the international aspects of business. CLO-2: Understand principles and processes of quality management (cost of quality, continuous improvement, etc.) CLO-3: An ability to apply engineering design to produce solutions that meet specified	Introduction		
2			Project management: Initiation,Planning or development, Production or execution		
3			Monitoring and controlling, Closing		
4			Optimization and Engineering economics		
5			Production system		
6			Production Planning and Control		
7			Requirements of Production Planning		
8			Production Control		
9			Product design and development		
10			Product analysis		
11			Types of Production Systems		
12			Plant layout		
13			Quality Control		
14					
15					

		needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. CLO-4: Be able to manage projects, time, financials, and people effectively and efficiently CLO-5: Use team skills such as leadership, followership and human relations to work effectively in a team environment. CLO-6: Be able to solve technical problems using empirical and analytical methods.			
1. Course Evaluation					
Tests: (30% (10+10+10)) Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be					

assigned (30%) of the final grade.

Assignments: (%)

There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week (1) to Week (15). The assignments' purpose is to gain experience and understanding of management information systems. Each assignment is worth Week (2.5) of the final grade.

Examinations:(%)

There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are **NOT** permitted. For more information refer to student handbook.

Mid-Semester Exam: (30%)

Mid-Semester exam will be held in Week (8). The mid-semester exam will examine material covered from Week (1) to Week (7). The mid-Semester exam is worth 30% of the final grade.

Final Exam: (60%)

Final exam will be held during the final examination period. The exam paper will test all the lectures covered in (Course Code). The exam is worth 60% of the final grade.

2. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Corse materials
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

● Course Name:
Internal Combustion Engine I
● Course Code:
MEER313
● Semester / Year:
First / 2023-2024

● Description Preparation Date:					
April / 2024					
● Available Attendance Forms:					
Full time					
● Number of Credit Hours (Total) / Number of Units (Total)					
60 / 3					
● Course administrator's name (mention all, if more than one name)					
Name: Dr. AyadTareq Mustafa Email: ayad.t.mustafa@nahrainuniv.edu.iq					
● Course Objectives					
Course Objectives			Study the Internal Combustion Engine fundamentals and its components, as well as identification the engine design, engine cycles, and the combustion occurs within the combustion chamber.		
● Teaching and Learning Strategies					
Strategy		The strategy based on the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.			
● Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	GO-3: An ability to communicate effectively with a range of audiences.	Introduction to heat engines, ICE classifications	Lecture	Quiz, homework, and discussion
2	2	GO-3: An ability to communicate effectively with a range of audiences.	Engine components and terminology, and Dynamometers	Lecture	Quiz, homework, and discussion
3	2	GO-1: An ability to identify, formulate, and solve complex engineering problems by	Operating parameters – Engine geometry	Lecture	Quiz, homework, and discussion

		applying principles of engineering, science, and mathematics.			
4	2	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	Work, Mean effective pressure, Torque and Power	Lecture	Quiz, homework, and discussion
5	2	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	Air-fuel ratio, Specific fuel consumption, Thermal and Volumetric efficiency	Lecture	Quiz, homework, and discussion
6	2	GO-6: An ability to develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.	Basic engine cycles, Four and Two stroke for SI and CI engine cycles	Lecture	Quiz, homework, and discussion
7	2	GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Mid Exam I		Examination
8	2	GO-1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering,	Air standard cycle, Otto cycle with thermodynamic analysis	Lecture	Quiz, homework, and discussion

		science, and mathematics.			
9	2	GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Real air-fuel engine cycles, SI engine cycle at part throttle	Lecture	Quiz, homework, and discussion
10	2	GO-1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	Diesel cycle and Dual cycle with thermodynamic analysis	Lecture	Quiz, homework, and discussion
11	2	GO-6: An ability to develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.	Comparison of Otto, Diesel, and Dual cycles, and Miller cycle	Lecture	Quiz, homework, and discussion
12	2	GO-3: An ability to communicate effectively with a range of audiences.	Two stroke cycles, Stirling cycle, Lenoir cycle	Lecture	Quiz, homework, and discussion
13	2	GO-6: An ability to develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.	Combustion reactions, Hydrocarbon fuels	Lecture	Quiz, homework, and discussion
14	2	GO-6: An ability to develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.	Self-ignition characteristics of fuels, Octan number, Cetane number	Lecture	Quiz, homework, and discussion
15	2	GO-5: An ability to function effectively	Mid Exam II		Examination

		on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.			
Course Evaluation					
Quizzes 5%, Laboratory 15%, Term Tests 20%, and Final Exam 60%					
Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Engineering fundamentals of the internal combustion engine By Willard W. Pulkrabek		
Main references (sources)			Internal combustion engines and air pollution by E. F. Obert		
Recommended books and references (scientific journals, reports...)			- The internal combustion engines in theory and practice by C. F. Taylor - Internal combustion engine fundamentals by John Heywood - Internal combustion engines by Penson		
Electronic References, Websites					

Course Description Form

Course Name:
Internal Combustion Engine II
Course Code:
MEER323
Semester / Year:
Second / 2023-2024
Description Preparation Date:
April / 2024
Available Attendance Forms:
Full time
Number of Credit Hours (Total) / Number of Units (Total)

30 / 2					
● Course administrator's name (mention all, if more than one name)					
Name: Dr. AyadTareq Mustafa Email: ayad.t.mustafa@nahrainuniv.edu.iq					
● Course Objectives					
Course Objectives			Study the Internal Combustion Engine fundamentals and its components, as well as identification the engine design, engine cycles, and the combustion occurs within the combustion chamber.		
● Teaching and Learning Strategies					
Strategy		The strategy based onthe main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.			
● Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	GO-3: An ability to communicate effectively with a range of audiences.	Air intake manifold, Intake valves	Lecture	Quiz, homework, and discussion
2	2	GO-1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	Fuel injectors, Carburetors, Supercharges and Turbocharges	Lecture	Quiz, homework, and discussion
3	2	GO-3: An ability to communicate effectively with a range of audiences.	Fluid motion within combustion chamber	Lecture	Quiz, homework, and discussion
4	2	GO-1: An ability to identify, formulate, and solve complex engineering	Combustion in SI engines	Lecture	Quiz, homework, and discussion

		problems by applying principles of engineering, science, and mathematics.			
5	2	GO-3: An ability to communicate effectively with a range of audiences.	Combustion in divided chamber engines, Modern fast-burn combustion chambers	Lecture	Quiz, homework, and discussion
6	2	GO-1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	Combustion in CI engines	Lecture	Quiz, homework, and discussion
7	2	GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Mid Exam I		Examination
8	2	GO-1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	Exhaust flow, Exhaust valves, Exhaust manifold	Lecture	Quiz, homework, and discussion
9	2	GO-3: An ability to communicate effectively with a range of audiences.	Emissions and air pollution	Lecture	Quiz, homework, and discussion
10	2	GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Heat transfer in (engines) intake system, combustion chamber, and exhaust system	Lecture	Quiz, homework, and discussion

11	2	GO-1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	Effect of engine operating variables on heat transfer	Lecture	Quiz, homework, and discussion
12	2	GO-3: An ability to communicate effectively with a range of audiences.	Air cooled engines, Liquid cooled engines	Lecture	Quiz, homework, and discussion
13	2	GO-1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	Mechanical (engine) friction	Lecture	Quiz, homework, and discussion
14	2	GO-3: An ability to communicate effectively with a range of audiences.	Engine lubrication system	Lecture	Quiz, homework, and discussion
15	2	GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Mid Exam II		Examination

● **Course Evaluation**

Homework 5%, Quizzes 10%, Term Tests 25%, and Final Exam 60%

● **Learning and Teaching Resources**

Required textbooks (curricular books, if any)	Engineering fundamentals of the internal combustion engine By Willard W. Pulkcrabek
Main references (sources)	Internal combustion engines and air pollution by E. F. Obert
Recommended books and references (scientific journals, reports...)	● The internal combustion engines in theory and practice by C. F. Taylor ● Internal combustion engine fundamentals by John Heywood ● Internal combustion engines by Penson

Electronic References, Websites	
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Course Description Form

• Course Name:					
Machine design I					
• Course Code:					
MEER313					
• Semester / Year:					
First /Third					
• Description Preparation Date:					
2/4/2024					
• Available Attendance Forms:					
In person + electronic					
• Number of Credit Hours (Total) / Number of Units (Total)					
3/3					
• Course administrator's name (mention all, if more than one name)					
Name: Asst. Prof. Dr. Ali H. Al-helli Email:: ali.h.mohammed@nahrainuniv.edu.iq					
• Course Objectives					
Course Objectives		1: To familiarize the various steps involved in the Design Process. 2: To understand the principals involved in evaluating the shape and dimensions of component. 3: To satisfy functional and strength requirements of machine elements. 4: To learn to use standard practices and standard data. 5: To learn to use catalogues and standard machine components.			
• Teaching and Learning Strategies					
Strategy		Lectures, lessons, case studies			
• Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	1,2,3,4	Introduction to Mechanical Engineering Design Materials, Load and Stress	Lectures, lessons, case studies	Activity, Assignments, exams

			Analysis Deflection Stiffness, units, standards		
2	3	1,2,3,4	Failures Resulting from St Loading, Fatigue Fai Resulting from Varia Loading	Lectures, lesse case studies	Activity, Assignments, exams
3	3	1,2,3,4	The Endurance Limit, Fati Strength, Stress Concentra and Notch Sensitivity,	Lectures, lesse case studies	Activity, Assignments, exams
4	3	1,2,3,4	Fatigue Failure Criteria Fluctuating Stress.	Lectures, lesse case studies	Activity, Assignments, exams
5	3	1,2,3,4	Combinations of Load Varying, Fluctuating Stres Cumulative Fatigue Damag	Lectures, lesse case studies	Activity, Assignments, exams
6	3	1,2,3,4	Welding, Bonding, and Design of Permanent Joints	Lectures, lesse case studies	Activity, Assignments, exams
7	3	1,2,3,4	Fatigue in welding, Probl on welding	Lectures, lesse case studies	Activity, Assignments, exams
8	3	1,2,3,4	Screws, Fasteners, and Design of Nonperman Joints	Lectures, lesse case studies	Activity, Assignments, exams
9	3	1,2,3,4	Power screws	Lectures, lesse case studies	Activity, Assignments, exams
10	3	1,2,3,4	Riveting and its design	Lectures, lesse case studies	Activity, Assignments, exams
11	3	1,2,3,4	Journal bearing design, the of viscous fluid.	Lectures, lesse case studies	Activity, Assignments, exams
12	3	1,2,3,4	charts of journal bea design, heat dissipation.	Lectures, lesse case studies	Activity, Assignments, exams
13	3	1,2,3,4	Shafts and Shaft Componen	Lectures, lesse case studies	Activity, Assignments, exams
14	3	1,2,3,4	Shaft Layout, Design Stress, Deflec Considerations.	Lectures, lesse case studies	Activity, Assignments, exams
15	3	1,2,3,4	Materials Critical Speeds Shafts, Miscellaneous S Components, Limits and I problems.	Lectures, lesse case studies	Activity, Assignments, exams
16	3	1,2,3,4	Preparatory week before final Exam	Lectures, lesse case studies	Activity, Assignments, exams
● Course Evaluation					
Daily 5, assignments 5, reports 10, semester exams 20, final exam 60					
● Learning and Teaching Resources					

Required textbooks (curricular books, if any)	Shigley's "Mechanical Engineering Design", Eighth Edition McGraw Hill 2006
Main references (sources)	Shigley's "Mechanical Engineering Design", Eighth Edition McGraw Hill 2006
Recommended books and references (scientific journals, reports...)	Gupta, "Mechanical Engineering Design" 2008 Niemman "machine elements"
Electronic References, Websites	https://www.engineeringtoolbox.com/

Course Description Form

● Course Name:	
Machine design II	
● Course Code:	
MEER323	
● Semester / Year:	
Second /Third	
● Description Preparation Date:	
2/4/2024	
● Available Attendance Forms:	
In person + electronic	
● Number of Credit Hours (Total) / Number of Units (Total)	
3/3	
● Course administrator's name (mention all, if more than one name)	
Name: Asst. Prof. Dr. Ali H. Al-helli Email: ali.h.mohammed@nahrainuniv.edu.iq	
● Course Objectives	
Course Objectives	1: To familiarize the various steps involved in the Design Process. 2: To understand the principals involved in evaluating the shape and dimensions of a component. 3: To satisfy functional and strength requirements of machine elements. 4: To learn to use standard practices and standard data. 5: To learn to use catalogues and standard machine components.
● Teaching and Learning Strategies	
Strategy	Lectures, lessons, case studies

● Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	1,2,3,4	Rolling-Contact Bearings. Types, Life, Load Life at Rated Reliability, Combined Radial and Thrust Loading. Rolling-Contact Bearings, Variable Loading .	Lectures, less case studies	Activity, Assignments, exams
2	3	1,2,3,4	Selection of Ball, Cylindrical & Tapered Roller Bearings, Design Assessment for Selected Rolling-Contact Bearings, Lubrication, Mounting and Enclosure	Lectures, less case studies	Activity, Assignments, exams
3	3	1,2,3,4	Design of springs, Stresses in Helical Springs, Compression Springs, Stability Spring Materials.	Lectures, less case studies	Activity, Assignments, exams
4	3	1,2,3,4	Compression design for static and fatigue.	Lectures, less case studies	Activity, Assignments, exams
5	3	1,2,3,4	Design of Extension Springs.	Lectures, less case studies	Activity, Assignments, exams
6	3	1,2,3,4	Design of Helical Coil Torsion Springs, Belleville Springs, Miscellaneous Springs, problems.	Lectures, less case studies	Activity, Assignments, exams
7	3	1,2,3,4	Welding, Bonding, and the Design of Permanent Joints, Fatigue in welding, Problems on welding	Lectures, less case studies	Activity, Assignments, exams
8	3	1,2,3,4	Welding, Bonding, and the Design of Permanent Joints.	Lectures, less case studies	Activity, Assignments, exams
9	3	1,2,3,4	Fatigue in welding, Problems on welding.	Lectures, less case studies	Activity, Assignments, exams
10	3	1,2,3,4	Clutches, Brakes, Internal Expanding & External Contracting Rims, Band-Type	Lectures, less case studies	Activity, Assignments, exams
11	3	1,2,3,4	Clutches.	Lectures, less case studies	Activity, Assignments, exams
12	3	1,2,3,4	Brakes, Frictional-Contact Axial Clutches, Disk Brakes, Cone Clutches and Brakes, Energy Considerations, Temperature Rise, Friction Materials	Lectures, less case studies	Activity, Assignments, exams
13	3	1,2,3,4	Couplings, types, materials, selection, Rigid Couplings, Marin.	Lectures, less case studies	Activity, Assignments, exams
14	3	1,2,3,4	Protected and unprotected, split muff couplings, Flexible couplings.	Lectures, less case studies	Activity, Assignments, exams

15	3	1,2,3,4	Spur gears, analysis and design, Helical, analysis and design	Lectures, less case studies	Activity, Assignments, exams
16	3	1,2,3,4	Bevel and Worm Gears, analysis and design	Lectures, less case studies	Activity, Assignments, exams
● Course Evaluation					
Daily 5, assignments 5, reports 10, semester exams 20, final exam 60					
● Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Shigley's "Mechanical Engineering Design", Eighth Edition McGraw Hill 2006		
Main references (sources)			Shigley's "Mechanical Engineering Design", Eighth Edition McGraw Hill 2006		
Recommended books and references (scientific journals, reports...)			Gupta, "Mechanical Engineering Design" 2008 Niemman "machine elements"		
Electronic References, Websites			https://www.engineeringtoolbox.com/		

Course Description Form

● Course Name:
Manufacturing Processes
● Course Code:
MEER315
● Semester / Year:
Second Semester/2023-2024
● Description Preparation Date:
April 2024
● Available Attendance Forms:
Full Attendance
● Number of Credit Hours (Total) / Number of Units (Total)
2 CL (hr/w) 2units

Course administrator's name (mention all, if more than one name)					
Name: Lecturer. Dr. Samer Jasim Mahmood Email: samer.j.mahmoud@nahrainuniv.edu.iq					
Course Objectives					
Course Objectives		This course aims to equip the students with principles, concepts and techniques that are essential in manufacturing processes in a wide range of industrial applications. Including machining as essential manufacturing processes and joining process.			
Teaching and Learning Strategies					
Strategy		The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials.			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction to manufacturing process and Machining process	Introduction to manufacturing process and Machining process	Lecture	Discusstion
2	2	Machining process	Machining process	Lecture videos	Quiz
3	2	Theory of Chips Formation in Metal Machining	Theory of Chips Formation in Metal Machining	Lecture videos	Discusstion
4	2	Cutting tool and turning	Cutting tool and turning	Lecture videos	Quiz
5	2	Drilling and Milling	Drilling and Milling	Lecture videos	Discusstion
6	2	Shaping, planning and grinding	Shaping, planning and grinding	Lecture videos	Quiz
7	2	Numerical control of machine tools	Numerical control of machine tools		Discusstion

8	2	Mid Examine \1	Mid Examine \1	Lecture	Quiz
9	2	Non-traditional Machining	Non-traditional Machining	Lecture	Discusstion
10	2	Non-traditional Machining	Non-traditional Machining	Lecture	Quiz
11	2	Non-traditional Machining	Non-traditional Machining	Lecture	Discusstion
12	2	Joining processes	Joining processes	Lecture videos	Discusstion
13	2	Joining processes	Joining processes	Lecture videos	Mid Exam / 1
14	2	Introduction to additive manufacturing	Introduction to additive manufacturing	Discussion	Discusstion
15	2	Mid Examine \2	Mid Examine \2	Discussion	Quiz

● Course Evaluation

Tests and home work: 5%

Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade.

Assignments: (5%)

The assignment will be based on running case study for material covered during the course

Mid-Semester Exam: (15%)(15+15)

Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 15 . The mid-semester exam will examine material covered from Week 1 to Week 6.

Final Exam: (60%)

● Learning and Teaching Resources

Required textbooks (curricular books, if any)	FUNDAMENTALS OF MODERN MANUFACTURING Materials, Processes, and Systems Fourth Edition Mikell P. Groover
Main references (sources)	FUNDAMENTALS OF MODERN MANUFACTURING Materials, Processes, and Systems Fourth Edition Mikell P. Groover
Recommended books and references (scientific journals, reports...)	Kalpakjian and Schmid, "Manufacturing Processes for Engineering Materials", 4th ed., Prentice-Hill Publishers , 2003.

Electronic References, Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering
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Course Description Form

Course Name:					
Engineering and Numerical Analysis I					
Course Code:					
MEER310					
Semester / Year:					
First Semester/2023-2024					
Description Preparation Date:					
April 2024					
Available Attendance Forms:					
Full Time					
Number of Credit Hours (Total) / Number of Units (Total)					
3 hours per week / 3 units					
Course administrator's name (mention all, if more than one name)					
Name: Asst. Prof. Dr. Ansam Adil Mohammed Email: ansam.a.mohammed@nahrainuniv.edu.iq					
Course Objectives					
Course Objectives			- Introduce the student about the details and Engineering and Numerical analysis state and then starts steps by step - Explaining all section in addition for examining the application of both fields.		
Teaching and Learning Strategies					
Strategy	Basic fundamentals of engineering analysis and its applications for field problems in determinates, matrices, Laplace transformations, fourier series, partial Differential Eqn. series solution of solving differential eqn. and complex (Number, Function, Integration).				
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	3	GO-1: An ability to identify , formulate , and solve complex engineering problems by applying principles of engineering , science, and mathematics.	Formation of Partial D.E.	Analysis	Tutorial , HW, Quiz
2	6	GO-1: An ability to identify , formulate , and solve complex engineering problems by applying principles of engineering , science, and mathematics.	Linear and non linear Eqn. of PDE	Analysis	Tutorial , HW, Quiz
3	6	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	Separation of variables for solving PDE.	Analysis	Tutorial , HW, Quiz
4	3	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	Applications of PDE	Analysis	Tutorial , HW, Quiz
5	3	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	Iteration method and curve fitting	Analysis	Tutorial , HW, Quiz
6	3	GO-3: An ability to communicate effectively with a range of audiences.	Approximate Evaluation of Roots of Polynomial Equations	Analysis	Tutorial , HW, Quiz
7	3	GO-3: An ability to communicate effectively with a range of audiences.	Mid Exam.1	Analysis	Tutorial , HW, Quiz
8	3	GO-5: An ability to function effectively on a team whose members together provide	Generation and modified Bessel function	Analysis	Tutorial , HW, Quiz

		leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.			
9		GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	complex plane and Complex function, Cauchy-Riemann eqns.	Analysis	Tutorial , HW, Quiz
10		GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Geometry of Analytic Function	Analysis	Tutorial , HW, Quiz
11		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Exponential, Hyperbolic Functions	Analysis	Tutorial , HW, Quiz
12		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Linear fractional transformations and Linear Integral in complex plane	Analysis	Tutorial , HW, Quiz
13		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Cauchy's Integral theorem and formula	Analysis	Tutorial , HW, Quiz
14		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	The complex inversion Formula	Analysis	Tutorial , HW, Quiz
15		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Mid Exam .2	Analysis	Tutorial , HW, Quiz
Course Evaluation					
Tests: 5% Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade.					

Assignments: (5%) There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade. Examinations There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook. Mid-Semester Exam: (15%)(15+15) Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9 . The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade. Final Exam: (60%) Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER212. The exam is worth 50% of the final grade.	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Advanced Engineering Mathematics by C. Ray Wylie.
Main references (sources)	Advanced Engineering Mathematics for engineers and scientists by G. S. Sharma.
Recommended books and references (scientific journals, reports...)	- Advanced Engineering Mathematics for engineers and scientists by M. R. Spiegel. - Advanced Engineering Mathematics by S.S.Sastry.
Electronic References, Websites	www. Engineering analysis in mechanical department ,Inwww.yahoo.com and in www.google.com

Course Description Form

Course Name:
Engineering and Numerical Analysis II
Course Code:
MEER320
Semester / Year:
Second Semester/2023-2024
Description Preparation Date:
April 2024
Available Attendance Forms:
Full Time
Number of Credit Hours (Total) / Number of Units (Total)
3 hours per week / 3 units

Course administrator's name (mention all, if more than one name)					
Name: Asst. Prof. Dr. Ansam Adil Mohammed Email: ansam.a.mohammed@nahrainuniv.edu.iq					
Course Objectives					
Course Objectives			- Introduce the student about the details and Engineering and Numerical analysis state and then starts steps by step - Explaining all section in addition for examining the application of both fields.		
Teaching and Learning Strategies					
Strategy		Basic fundamentals of engineering analysis and its applications for field problems in determinates, matrices, Laplace transformations, fourier series, partial Differential Eqn. series solution of solving differential eqn. and complex (Number, Function, Integration).			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	GO-1: An ability to identify , formulate , and solve complex engineering problems by applying principles of engineering , science, and mathematics.	Finite Difference	Analysis	Tutorial , HW, Quiz
2	6	GO-1: An ability to identify , formulate , and solve complex engineering problems by applying principles of engineering , science, and mathematics.	Numerical Integration	Analysis	Tutorial , HW, Quiz
3	6	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	Trapezoudal Rule and Mid – Ordinate Rule	Analysis	Tutorial , HW, Quiz
4	3	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of	Simpson`s Rule	Analysis	Tutorial , HW, Quiz

		public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.			
5	3	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	Numerical Solution of ODE	Analysis	Tutorial , HW, Quiz
6	3	GO-3: An ability to communicate effectively with a range of audiences.	Problem	Analysis	Tutorial , HW, Quiz
7	3	GO-3: An ability to communicate effectively with a range of audiences.	Mid Exam.1	Analysis	Tutorial , HW, Quiz
8	3	GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Euler`s Method	Analysis	Tutorial , HW, Quiz
9		GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Taylor Series Estimation of error of Euler`s Mrthod	Analysis	Tutorial , HW, Quiz
10			Mid Exam 1		Exam
11		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Modified Euler`s Method	Analysis	Tutorial , HW, Quiz
12		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Second Order Runge-Kutta Method	Analysis	Tutorial , HW, Quiz

13		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Third and Fourth Order Runge- Kutta Method	Analysis	Tutorial , HW, Quiz
14		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Tutorial	Analysis	Tutorial , HW, Quiz
15			Mid Exam 2		Exam 2
Course Evaluation					
Tests: 5% Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade. Assignments: (5%) There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade. Examinations There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook. Mid-Semester Exam: (15%)(15+15) Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9 . The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade. Final Exam: (60%) Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER212. The exam is worth 50% of the final grade.					
Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Advanced Engineering Mathematics by C. Ray Wylie.		
Main references (sources)			Advanced Engineering Mathematics for engineers and scientists by G. S. Sharma.		
Recommended books and references (scientific journals, reports...)			- Advanced Engineering Mathematics for engineers and scientists by M. R. Spiegel. - Advanced Engineering Mathematics by S.S.Sastry.		
Electronic References, Websites			www. Engineering analysis in mechanical department ,Inwww.yahoo.com and in www.google.com		

Course Description Form

Course Name:
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Production Engineering					
Course Code:					
MEER324					
Semester / Year:					
Second Semester/2023-2024					
Description Preparation Date:					
April 2024					
Available Attendance Forms:					
Full Attendance					
Number of Credit Hours (Total) / Number of Units (Total)					
2 CL (hr/w) 2 units					
Course administrator's name (mention all, if more than one name)					
Name: Prof. Dr. Ayad Murad Takhakh, Lecturer. Dr. Samer Jasim Mahmood Email: samer.j.mahmoud@nahrainuniv.edu.iq					
Course Objectives					
Course Objectives		This course is designed to provide the student with the understanding of production engineering and equip the student with fundamentals of metal casting process, and production of metal forming processes. understand and explain powder metallurgy process.			
Teaching and Learning Strategies					
Strategy		The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials.			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Production of Metals	Production of Metals	Lecture	Discusstion
2	2	(iron ,Cast iron ,Steel)	(iron ,Cast iron ,Steel)	Lecture videos	Quiz Discusstion
3	2	Non- Ferrous Metals & Alloys	Non- Ferrous Metals & Alloys	Lecture videos	Quiz Discusstion
4	2	Production of Non-Metallic Materials	Production of Non-Metallic Materials	Lecture videos	Quiz Discusstion

5	2	Sand casting	Sand casting	Lecture videos	Quiz Discusstion
6	2	Die casting	Die casting	Lecture videos	Quiz Discusstion
7	2	Other casting processes	Other casting processes		Discusstion
8	2	Mid Exam / 1	Mid Exam / 1	Lecture	Mid Exam / 1
9	2	Forming Process	Forming Process	Lecture	Discusstion
10	2	Rolling ,Forging ,Extrusion	Rolling ,Forging ,Extrusion	Lecture	Quiz Discusstion
11	2	Drawing and deep Drawing	Drawing and deep Drawing	Lecture	Quiz Discusstion
12	2	Powder Metallurgy	Powder Metallurgy	Lecture videos	Discusstion
13	2	Plastic Processing	Plastic Processing	Lecture videos	Discusstion
14	2	Production of gear and Threads	Production of gear and Threads	Discussion	Discusstion
15	2	Mid Exam / 1	Mid Exam / 1	Discussion	Mid Exam / 2
Course Evaluation					
Tests and home work: 5% Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade. Assignments: (5%) The assignment will be based on running case study for material covered during the course Mid-Semester Exam: (15%)(15+15) Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 15 . The mid-semester exam will examine material covered from Week 1 to Week 6. Final Exam: (60%)					
Learning and Teaching Resources					
Required textbooks (curricular books, if any)			DeGarmo, Black, Kohser, Materials and Processes in Manufacturing, 1997 Edition		
Main references (sources)			DeGarmo, Black, Kohser, Materials and Processes in Manufacturing, 1997 Edition		
Recommended books and references (scientific journals, reports...)			FUNDAMENTALS OF MODERN MANUFACTURING Materials, Processes, and Systems Fourth Edition Mikell P. Groover		
Electronic References, Websites			https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering		

Course Description Form

Course Name:					
Heat Transfer I					
Course Code:					
MEER 311					
Semester / Year:					
First Semester/2023-2024					
Description Preparation Date:					
March, 2024					
Available Attendance Forms:					
Full Time					
Number of Credit Hours (Total) / Number of Units (Total)					
3 hours per week / 2 units					
Course administrator's name (mention all, if more than one name)					
Name: Prof. Dr. Ahmed F. Khudheyer Email: ahmed.f.khudheyer@nahrainuniv.edu.iq					
Course Objectives					
Course Objectives		This course is designed to introduce a basic study of the phenomena of heat transfer, to develop methodologies for solving a wide variety of practical engineering problems, and to provide useful information concerning the performance and design of particular systems and processes. A knowledge-based design problem requiring the formulations of solid conduction and fluid convection and the technique of numerical computation progressively elucidated in different chapters will be assigned and studied in detail. As well, to gain experience in designing experiments for thermal systems, the design, fabrication, and experimentation of a thin film heat flux gage will be attempted as part of laboratory requirements.			
Teaching and Learning Strategies					
Strategy		- Teaching Method 1 – Lecture// Description: Students are provided with detailed notes. These are reviewed and enhanced in lecture classes through PowerPoint presentations. Application of theoretical knowledge is illustrated through many worked examples and in tutorial sessions that involve significant student involvement and interaction. - Teaching Method 2 – Tutorial// Description: Tutorial problems are designed to give students experience in applying their knowledge and understanding to practical heat transfer problems.			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	3	GO-1: an ability to identify, formulate, and solve engineering problems	Introduction to Heat Transfer	Analysis	Tutorial , HW, Quiz
2	6	GO-1: an ability to identify, formulate, and solve engineering problems	Steady State Conduction-One Dimension- Plane Systems & Radial Systems	Analysis	Tutorial , HW, Quiz
3	6	GO-2: an ability to use the techniques, skills, and modern engineering tools necessary for Engineering practice	Overall Heat Transfer Coefficient& Critical Radius of Insulation	Analysis	Tutorial , HW, Quiz
4	3	GO-2: an ability to use the techniques, skills, and modern engineering tools necessary for Engineering practice	Heat Source Systems-Plane Wall	Analysis	Tutorial , HW, Quiz
5	3	GO-2: an ability to use the techniques, skills, and modern engineering tools necessary for Engineering practice	Heat Source Systems-Radial Systems	Analysis	Tutorial , HW, Quiz
6	3	GO-3: able to acquire and apply new knowledge as needed, using appropriate learning strategies.	Conduction-Convection Systems(Fins)	Analysis	Tutorial , HW, Quiz
7	3	GO-3: able to acquire and apply new knowledge as needed, using appropriate learning strategies.	Mid Exam.1	Analysis	Tutorial , HW, Quiz
8	3	GO-2: an ability to use the techniques, skills, and modern engineering tools necessary for Engineering practice	Fin Efficiency and effectiveness & Thermal contact Resistance	Analysis	Tutorial , HW, Quiz
9		GO-2: an ability to use the techniques, skills, and modern engineering tools necessary for Engineering practice	Steady State Conduction-Multiple Dimensions.	Analysis	Tutorial , HW, Quiz
10		GO-2: an ability to use the techniques, skills, and modern engineering tools necessary for Engineering practice	Conduction Shape Factor	Analysis	Tutorial , HW, Quiz
11		GO-2: an ability to use the techniques, skills, and modern engineering tools necessary for Engineering practice	Unsteady State Conduction- Lumped Heat Capacity Analysis	Analysis	Tutorial , HW, Quiz
12		GO-2: an ability to use the techniques, skills, and modern engineering	Transient Heat Flow in Semi-Infinite Solid	Analysis	Tutorial , HW, Quiz

		tools necessary for Engineering practice			
13		GO-2: an ability to use the techniques, skills, and modern engineering tools necessary for Engineering practice	Semi-Infinite Solid with Convection Boundary Conditions & Multidimensional Systems	Analysis	Tutorial , HW, Quiz
14		GO-2: an ability to use the techniques, skills, and modern engineering tools necessary for Engineering practice	Transient Numerical Method	Analysis	Tutorial , HW, Quiz
15		GO-2: an ability to use the techniques, skills, and modern engineering tools necessary for Engineering practice	Mid Exam .2	Analysis	Tutorial , HW, Quiz
Course Evaluation Tests: 5% Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade. Assignments: (5%) There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade. Examinations There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook. Mid-Semester Exam: (15%)(15+15) Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9 . The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade. Final Exam: (60%) Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER212. The exam is worth 50% of the final grade.					
Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Heat Transfer Principles and Applications, Charles H. Forsberg, 2021 Elsevier Inc.		
Main references (sources)			Heat Transfer Principles and Applications, Charles H. Forsberg, 2021 Elsevier Inc.		
Recommended books and references (scientific journals, reports...)			HEAT AND MASS TRANSFER, FUNDAMENTALS & APPLICATIONS, SIXTH EDITION, 2021		
Electronic References, Websites					

Course Description Form

Course Name:					
Heat Transfer II					
Course Code:					
MEER 321					
Semester / Year:					
2 nd Semester/2023-2024					
Description Preparation Date:					
March, 2024					
Available Attendance Forms:					
Full Time					
Number of Credit Hours (Total) / Number of Units (Total)					
3 hours per week / 3 units					
Course administrator's name (mention all, if more than one name)					
Name: Prof. Dr. Ahmed F. Khudheyer Email: ahmed.f.khudheyer@nahrainuniv.edu.iq					
Course Objectives					
Course Objectives		This module aims to enhance the students' understanding of heat transfer principles by applying them to a range of thermal systems and processes. Concepts in conductive, radiative and convective heat transfer are introduced; various techniques are explained for the solution of heat transfer problems, emphasizing real life problems such as practical heat exchangers and heat sinks. The aim is also to install within the students an awareness of the environmental and social implications of engineering technology, especially regarding energy efficiency and safety. Students also gain experience of the use of practical measurement techniques and modern computer-based presentation and analysis			
Teaching and Learning Strategies					
Strategy		- Teaching Method 1 - Lecture Description: Students are provided with detailed notes. These are reviewed and enhanced in lecture classes through PowerPoint presentations. Application of theoretical knowledge is illustrated through many worked examples and in tutorial sessions that involve significant student involvement and interaction. - Teaching Method 2 - Tutorial Description: Tutorial problems are designed to give students experience in applying their knowledge and understanding to practical heat transfer problems.			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	3	GO-1: an ability to identify, formulate, and solve engineering problems	Principles of Convection	Analysis	Tutorial , HW, Quiz
2	6	GO-1: an ability to identify, formulate, and solve engineering problems	Laminar And Turbulent Boundary Layer	Analysis	Tutorial , HW, Quiz
3	6	GO-2: an ability to use the techniques, skills, and modern engineering tools necessary for Engineering practice	Thermal Boundary Layer	Analysis	Tutorial , HW, Quiz
4	3	GO-2: an ability to use the techniques, skills, and modern engineering tools necessary for Engineering practice	Empirical Relations For Forced Convection- Pipe Flow	Analysis	Tutorial , HW, Quiz
5	3	GO-2: an ability to use the techniques, skills, and modern engineering tools necessary for Engineering practice	Forced Convection- Cross Flow& Bank of Tubes	Analysis	Tutorial , HW, Quiz
6	3	GO-4: the ability to apply their knowledge and understanding to develop and realize designs of thermal systems to meet defined and specified requirements;	Free Convection Heat Transfer	Analysis	Tutorial , HW, Quiz
7	3	GO-4: the ability to apply their knowledge and understanding to develop and realize designs of thermal systems to meet defined and specified requirements;	Mid Examine	Analysis	Tutorial , HW, Quiz
8	3	GO-4: the ability to apply their knowledge and understanding to develop and realize designs of thermal systems to meet defined and specified requirements;	Vertical Plates and Cylinders	Analysis	Tutorial , HW, Quiz
9		GO-4: the ability to apply their knowledge and understanding to develop and realize designs of thermal systems to meet defined and specified requirements;	Horizontal Plates and Cylinders	Analysis	Tutorial , HW, Quiz

10		GO-4: the ability to apply their knowledge and understanding to develop and realize designs of thermal systems to meet defined and specified requirements;	Introduction To Radiation Heat Transfer	Analysis	Tutorial , HW, Quiz
11		GO-4: the ability to apply their knowledge and understanding to develop and realize designs of thermal systems to meet defined and specified requirements;	Radiation Shape Factor& Heat Exchange Between Nonblack Bodies	Analysis	Tutorial , HW, Quiz
12		GO-4: the ability to apply their knowledge and understanding to develop and realize designs of thermal systems to meet defined and specified requirements;	Infinite Parallel Planes & Radiation Shields	Analysis	Tutorial , HW, Quiz
13		GO-4: the ability to apply their knowledge and understanding to develop and realize designs of thermal systems to meet defined and specified requirements;	Heat Exchangers	Analysis	Tutorial , HW, Quiz
14		GO-4: the ability to apply their knowledge and understanding to develop and realize designs of thermal systems to meet defined and specified requirements;	Effectiveness-NTU Method	Analysis	Tutorial , HW, Quiz
15		GO-4: the ability to apply their knowledge and understanding to develop and realize designs of thermal systems to meet defined and specified requirements;	Mid Exam .2	Analysis	Tutorial , HW, Quiz

• Course Evaluation

Tests: 5%

Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade.

Assignments: (5%)

There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade. Examinations There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook. Mid-Semester Exam: (15%)(15+15) Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9 . The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade. Final Exam: (60%) Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER212. The exam is worth 50% of the final grade.	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Heat Transfer Principles and Applications, Charles H. Forsberg, 2021 Elsevier Inc.
Main references (sources)	HEAT AND MASS TRANSFER, FUNDAMENTALS & APPLICATIONS, SIXTH EDITION, 2021
Recommended books and references (scientific journals, reports...)	HEAT AND MASS TRANSFER, FUNDAMENTALS & APPLICATIONS, SIXTH EDITION, 2021
Electronic References, Websites	

Course Name:	
Statistics	
Course Code:	
CREQ321	
Semester / Year:	
First Semester / Third Year	
Description Preparation Date:	
Year 2023-2022	
Available Attendance Forms:	
Class attendance and electronic meeting	
Number of Credit Hours (Total) / Number of Units (Total)	
2\2	
Course administrator's name (mention all, if more than one name)	
Name: Dr Noor Yehia Abbas Email: noor.y.abbas@nahrainuniv.edu.iq	
Course Objectives	
These objectives aim to build a comprehensive skill set in statistics, from basic concepts to ethical practice, preparing students	- To equip students with a foundational grasp of statistical principles and methodologies, enabling them to probability and hypothesis testing in various contexts. - To develop students' ability to identify and categorize different data types and select the most suitable statistical methods for analysis. - To foster an understanding of statistical inference's role in decision-making and teach students how to apply statistical tests to infer population characteristics from sample data. - To train students in designing robust experiments and collecting data systematically to reduce bias and error.

for practical application in their respective fields.		- the validity of research findings. - To raise students’ awareness of the ethical implications in statistical practice, emphasizing the protection of participant privacy and the integrity of analytical conclusions.			
Teaching and Learning Strategy:					
Strategy	- Active Learning: Encourage student engagement through interactive activities like group discussions, problem-solving sessions, and hands-on projects. - Use of Real Data: Integrate real-world data sets to help students understand the relevance and application of statistical methods. - Case Studies and Examples: Present case studies and practical examples to illustrate statistical concepts and applications. - Mini Projects: Assign mini projects that require students to apply statistical methods to real-life scenarios. - Consistent Course Structure: Maintain a consistent structure in course design to help students navigate the course easily. - Ethical Considerations: Discuss ethical considerations in data analysis, emphasizing the importance of integrity in statistical practice.				
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2	Textbook readings on Introduction to Statistics	Grouped Data	Describe and analyze data using appropriate methods for grouped data, considering factors like frequency tables, histograms, and potential bias requiring	Homework assignment
Week 2	2	Textbook readings on The General Steps of Constructing a Frequency Distribution	The General Steps of Constructing the Frequency Distribution	Identify steps to construct a frequency distribution	In-class activity
Week 3	2	Textbook readings on Frequency Distribution	Relative Frequency	Calculate and interpret relative frequency	Quiz
Week 4	2	Textbook readings on Cumulative Frequency Distribution	Cumulative Freq. Distribution		In-class activity
Week 5	2	Review All	Mid Exam / 1	Exam	Exam
Week 6	2	Textbook readings on Graphical presentation of Frequency Distribution	Graphics presentation of Freq. Distrib.	Construct frequency tables & histograms for data sets	In-class activity

Week 7	2	Textbook readings on Measurement of presentation of Freq. Distrib	Measurement of presentation of Freq. Distrib	Calculate and interpret cumulative frequency	Homework assignment
Week 8	2	Textbook readings on Measure Descriptions of presentation of Freq. Distrib	Measure Descriptions of presentation of Freq. Distrib	Describe shape and characteristics of a frequency distribution	Homework assignment
Week 9	2	Textbook readings on Arithmetic & Harmonic Mean	Arithmetic & Harmonic Mean	Calculate and interpret cumulative frequency	In-class activity
Week 10	2	Textbook readings on Other Measure of Central Tendency	Other Measure of Central Tendency	Describe shape and characteristics of a frequency distribution	In-class activity
Week 11	2	Textbook readings on Relation between Mean & Mode	Relation between Mean & Mode	Define and calculate arithmetic mean and harmonic mean	Quiz
Week 12	2	Textbook readings on STD deviation & other Measure	STD deviation & other Measure	Understand and apply standard deviation, range, IQR, and percentiles to analyze data variability, considering their strengths and weaknesses for different data types.	In-class activity
Week 13	2	Textbook readings on Moments	Moments	Understand and apply moments (central and absolute) to analyze data distributions (symmetry, spread, etc.).	In-class activity
Week 14	2	Textbook readings on Sheppard Corrections	Sheppard Corrections	Correct bias in moments calculated from grouped data and interpret the impact on data analysis.	In-class activity
Week 15	2	Review All	Mid Exam / 2		Exam

• **Course Evaluation**

The specific breakdown of points allocated to different tasks will depend on the course content and learning objectives. Here's evaluation framework:

- Exams (written, monthly): 40-50% (evaluates knowledge retention and application).
- Daily Preparation (class participation, quizzes): 20-30% (assesses engagement and understanding of daily concepts).
- Projects/Reports: 15-25% (measures research, communication, and critical thinking skills).

Oral Participation: 5-10% (encourages verbal communication and critical thinking)	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	<i>“Engineering Statistics, 5th Edition” by Douglas C. Montgomery, George C. Runger, and Norma F. Hubele.</i>
Main references (sources)	<i>“Springer Handbook of Engineering Statistics”.</i> <i>“Modern Engineering Statistics” by Thomas P. Ryan.</i>
Recommended books and references (scientific journals, reports...)	<i>Books:</i> <i>“Modern Engineering Statistics” by Thomas P. Ryan¹.</i> <i>“Springer Handbook of Engineering Statistics” for a wide-ranging selection of statistical techniques².</i> <i>“Engineering Statistics, 5th Edition” by Douglas C. Montgomery, George C. Runger, and Norma F. Hubele for modern coverage of engineering statistics³.</i> <i>Scientific Journals:</i> <i>“Engineering Science” section of the NEJSDS for original statistical methodology and application research in engineering science⁴.</i> <i>“Journal Rankings on Engineering (miscellaneous)” for a comprehensive list of engineering-related journals⁵.</i> <i>Reports:</i> <i>“UNESCO Engineering Report” for insights into the role of engineering in sustainable development⁶.</i> <i>“The State of U.S. Science and Engineering 2022” by NSF for in-depth data on STEM education and the workforce⁷.</i> <i>“EngineeringUK” report for key facts and figures on the state of engineering in the UK</i>
<u>Electronic References, Websites</u>	<i>NIST/SEMATECH Engineering Statistics Handbook: A comprehensive web-based book that helps scientists and engineers incorporate statistical methods into their work.</i> <i>Springer Handbook of Engineering Statistics: Offers a wide selection of statistical techniques and tools, covering various methods and their applications across different fields.</i> <i>MIT OpenCourseWare: Provides free lecture notes and course materials on probability and statistics in engineering, which can be a valuable educational resource.</i>

Course Name:
Statistics
Course Code:
CREQ321
Semester / Year:
First Semester / Third Year
Description Preparation Date:
Year 2023-2022
Available Attendance Forms:
Class attendance and electronic meeting

Number of Credit Hours (Total) / Number of Units (Total)					
2\2					
Course administrator's name (mention all, if more than one name)					
Name: Dr Noor Yehia Abbas Email: noor.y.abbas@nahrainuniv.edu.iq					
Course Objectives					
These objectives aim to build a comprehensive skill set in statistics, from basic concepts to ethical practice, preparing students for practical application in their respective fields.		- To equip students with a foundational grasp of statistical principles and methodologies, enabling them to probability and hypothesis testing in various contexts. - To develop students’ ability to identify and categorize different data types and select the most suitable statistical methods for analysis. - To foster an understanding of statistical inference’s role in decision-making and teach students how to apply statistical tests to infer population characteristics from sample data. - To train students in designing robust experiments and collecting data systematically to reduce bias and ensure the validity of research findings. - To raise students’ awareness of the ethical implications in statistical practice, emphasizing the protection of participant privacy and the integrity of analytical conclusions.			
Teaching and Learning Strategy:					
Strategy		- Active Learning: Encourage student engagement through interactive activities like group discussions, problem-solving sessions, and hands-on projects. - Use of Real Data: Integrate real-world data sets to help students understand the relevance and application of statistical methods. - Case Studies and Examples: Present case studies and practical examples to illustrate statistical concepts and their applications. - Mini Projects: Assign mini projects that require students to apply statistical methods to real-life scenarios. - Consistent Course Structure: Maintain a consistent structure in course design to help students navigate the course easily. - Ethical Considerations: Discuss ethical considerations in data analysis, emphasizing the importance of integrity in statistical practice.			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2	Textbook readings on Introduction to Statistics	Grouped Data	Describe and analyze data using appropriate methods for grouped data, considering factors like frequency tables, histograms, and potential bias requiring	Homework assignment
Week 2	2	Textbook readings on The General Steps of Constructing a Frequency Distribution	The General Steps of Construct the Frequency Distribution	Identify steps to construct a frequency distribution	In-class activity

Week 3	2	Textbook readings on Frequency Distribution	Relative Frequency	Calculate and interpret relative frequency	Quiz
Week 4	2	Textbook readings on Cumulative Frequency Distribution	Cumulative Freq. Distribution		In-class activity
Week 5	2	Review All	Mid Exam / 1	Exam	Exam
Week 6	2	Textbook readings on Graphical presentation of Frequency Distribution	Graphics presentation of Freq. Distrib.	Construct frequency tables & histograms for data sets	In-cla activi
Week 7	2	Textbook readings onMeasurement of presentation of Freq. Distrib	Measurement of presentation of Freq. Distrib	Calculate and interpret cumulative frequency	Homew assignm
Week 8	2	Textbook readings onMeasure Descriptions of presentation of Freq. Distrib	Measure Descriptions of presentation of Freq. Distrib	Describe shape and characteristics of a frequency distribution	Homewo assignme
Week 9	2	Textbook readings onArithmetic & Harmonic Mean	Arithmetic & Harmonic Mean	Calculate and interpret cumulative frequency	In-class activity
Week 10	2	Textbook readings onOther Measure of Central Tendency	Other Measure of Central Tendency	Describe shape and characteristics of a frequency distribution	In-class activity
Week 11	2	Textbook readings onRelation between Mean & Node	Relation between Mean & Node	Define and calculate arithmetic mean and harmonic mean	Quiz
Week 12	2	Textbook readings onSTD deviation & other Measure	STD deviation & other Measure	Understand and apply standard deviation, range, IQR, and percentiles to analyze data variability, considering their strengths and weaknesses for different data types.	In-class activity
Week 13	2	Textbook readings onMoments	Moments	Understand and apply moments (central and absolute) to analyze data distributions	In-class activity

				(symmetry, spread, etc.).	
Week 14	2	Textbook readings on Sheppard Corrections	Sheppard Corrections	Correct bias in moments calculated from grouped data and interpret the impact on data analysis.	In-class activity
Week 15	2	Review All	Mid Exam / 2		Exam
- Course Evaluation The specific breakdown of points allocated to different tasks will depend on the course content and learning objectives. Here's evaluation framework: - Exams (written, monthly): 40-50% (evaluates knowledge retention and application). - Daily Preparation (class participation, quizzes): 20-30% (assesses engagement and understanding of daily concepts). - Projects/Reports: 15-25% (measures research, communication, and critical thinking skills). - Oral Participation: 5-10% (encourages verbal communication and critical thinking)					
Learning and Teaching Resources					
Required textbooks (curricular books if any)		<i>"Engineering Statistics, 5th Edition" by Douglas C. Montgomery, George C. Runger, and Norma F. Hubele.</i>			
Main references (sources)		<i>"Springer Handbook of Engineering Statistics".</i> <i>"Modern Engineering Statistics" by Thomas P. Ryan.</i>			
Recommended books and references (scientific journals, reports...)		<i>Books:</i> <i>"Modern Engineering Statistics" by Thomas P. Ryan</i>¹. <i>"Springer Handbook of Engineering Statistics" for a wide-ranging selection of statistical techniques</i>². <i>"Engineering Statistics, 5th Edition" by Douglas C. Montgomery, George C. Runger, and Norma F. Hubele for modern coverage of engineering statistics</i>³. <i>Scientific Journals:</i> <i>"Engineering Science" section of the NEJSDS for original statistical methodology and application research in engineering science</i>⁴. <i>"Journal Rankings on Engineering (miscellaneous)" for a comprehensive list of engineering-related journals</i>⁵. <i>Reports:</i> <i>"UNESCO Engineering Report" for insights into the role of engineering in sustainable development</i>⁶. <i>"The State of U.S. Science and Engineering 2022" by NSF for in-depth data on STEM education and the workforce</i>⁷. <i>"EngineeringUK" report for key facts and figures on the state of engineering in the UK</i>⁸.			
<u>Electronic References, Websites</u>		<i>NIST/SEMATECH Engineering Statistics Handbook: A comprehensive web-based book that helps scientists and engineers incorporate statistical methods into their work.</i> <i>Springer Handbook of Engineering Statistics: Offers a wide selection of statistical techniques and tools, covering various methods and their applications across different fields.</i>			

	MIT OpenCourseWare: Provides free lecture notes and course materials on probability and statistics in engineering, which can be a valuable education resource.
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Course Description Form

Course Name:	
ADDITIVE MANUFACTURING	
Course Code:	
MEER420	
Semester / Year:	
Second / Fourth years	
Description Preparation Date:	
2023-2024	
Available Attendance Forms:	
Fourth years student	
Number of Credit Hours (Total) / Number of Units (Total)	
3/3	
Course administrator's name (mention all, if more than one name)	
Name: Dr. Hala Salman Hasan / ASST.LEC. Saif Ali Yasir Email: halasalman2006@yahoo.com saif.yasir@nahrainuniv.edu.iq	
Course Objectives	
Course Objectives 5. GO-1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineer science, and mathematics. 6. GO-3: An ability to communicate effectively with a range of audiences. 7. GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative inclusive environment, establish goals, plan tasks, and meet objectives. 8. GO-7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	
Teaching and Learning Strategies	
Strategy	7. CLO-1: Demonstrate knowledge of the terminology associated with additive manufacturing technology. 8. CLO-2: Demonstrate the knowledge of Additive Manufacturing and Rapid Prototyping technologies. 9. CLO-3: Demonstrate knowledge of 3D printing process and compare with conventional manufacturing processes. 10. CLO-4: Describe the different types of file formats used in additive manufacturing. Demonstrate knowledge of basic 3D forming and development techniques.

	11. CLO-5: Demonstrate knowledge of emerging technology and developments in additive manufacturing how this impacts on an industry sector 12. CLO-6: Discuss fundamentals of Reverse Engineering.
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● Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2 3 4 5 6 7 8 9 10 11 12	3	1. CLO-1: Demonstrate knowledge of the terminology associated with additive manufacturing technology. 2. CLO-2: Demonstrate knowledge of Additive Manufacturing and Rapid Prototyping technologies. 3. CLO-3: Demonstrate knowledge of 3D printing process and compare with conventional manufacturing processes. 4. CLO-4: Describe the different types of file formats used in additive manufacturing. Demonstrate knowledge of basic 3D forming and development techniques. 5. CLO-5: Demonstrate knowledge of emerging technology and developments in additive manufacturing and how this impacts on an industry sector 6. CLO-6: Discuss fundamentals of Reverse Engineering.	01_Introduction 02_Product_Creation 03_prototypes 04_Classification 05_Preprocessing 06-01_Sheet_lamination 06-02_Photopolymerization 06-03_MaterialExtrusion 6 Weeks Training CAD System (2D, 3D) 3D Printing (FDM, SLA)	Lec. +Example	Tutorial+ discussion

● Course Evaluation

Test	Week 4(10%)	
Exam 1	Week 7	(20%)
Exam 2	Week 9	(20%)
Exam 3	Week 11	(20%)
Assignment I	Week 12	(10%)
Final Exam	Week	60 %
Learning and Teaching Resources		
Required textbooks (curricular books, if any)	Understanding additive manufacturing	
Main references (sources)	Additive manufacturing	
Recommended books and references (scientific journals, reports...)		
Electronic References, Websites		

Course Description Form

Course Name:	
CAD / CAM	
Course Code:	
Meer 410	
Semester / Year:	
First / Forth years	
Description Preparation Date:	
2023-2024	
Available Attendance Forms:	
Forth years student	
Number of Credit Hours (Total) / Number of Units (Total)	
3/3	
Course administrator's name (mention all, if more than one name)	
Name: Dr. Hala Salman Hasan / ASST.LEC. Saif Ali Yasir Email: halasalman2006@yahoo.com saif.yasir@nahrainuniv.edu.iq	
Course Objectives	
Course Objectives	

CAD/CAM refers to the integration of Computer-aided design (CAD) and Computer-aided manufacturing (CAM). Both these require powerful computers. CAD software helps designers and draftsmen; CAM "reduces manpower costs" in the manufacturing process.			•		
• Teaching and Learning Strategies					
Strategy	1. Will have an idea of the computer aided design concept. 2. Will have the ability to work in 3D in the virtual environment. 3. May create physical models out of the models created in SolidWorks 4. Will have an idea in G-code. Continuous assessment Tests (Quiz) Examinations (Mids. and final)				
• Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2 3 4 5 6 7 8 9 10 11 12	3	1. Will have an idea of the computer aided design concept. 2. Will have the ability to work in 3D in the virtual environment. 3. May create physical models out of the models created in SolidWorks. 4. Will have an idea in G-code	Introduction History Geometrical transformations Concatenation of transformation Geometric modeling Exam Numerical control Exam CNC G code Exam SolidWorks exam	Lec. +Example	Tutorial+ discussion
• Course Evaluation					
Test Week 4(10%) Exam 1 Week 7 (20%)					

Exam 2	Week 9	(20%)
Exam 3	Week 11	(20%)
Assignment I	Week 12	(10%)
Final Exam	Week	60 %
Learning and Teaching Resources		
Required textbook (curricular books, if any)	Computer Aided Design and Manufacturing, C.B. Besant, 1986.	
Main references (source)	CAD/CAM, Mc Mahan and Browne, 1998.	
Recommended books and references (scientific journals, reports...)	CAD/CAM in practice, Medland, 1988. Computer Aided Manufacture, Chang and Richard, 2006. CAD/CAM Principles and Applications, Rao, 2010. ComputerAided manufacturing, S. Vishal, 2013. Fundamental of Computer Aided Design, Goyal, 2013.	
Electronic Reference Websites		

Course Description Form

Course Name:
Control Engineering and Measurements I
Course Code:
MEER413
Semester / Year:
First Semester/2023-2024
Description Preparation Date:
April 2024
Available Attendance Forms:
April 2024
Number of Credit Hours (Total) / Number of Units (Total)
3 hours per week / 3 units
Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. muhammedabdulsattar

Email:mohammed.aa.mohammed@nahrain.univ.edu					
Course Objectives					
Course Objectives			- Introduce the student about the details and control system and then starts steps by step - Explaining control section in addition for examining the application of both fields.		
Teaching and Learning Strategies					
Strategy	Introducing the student to the details and providing the basic elements for analyzing mechanical components, with a clear focus on the application of mechanical engineering. Introduction to measurements and devices used for measurements in electromechanical systems and an introduction to control systems.				
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction and Basic Concepts of control Transfer Function	control	Analysis	Tutorial , HW, Quiz
2-3	6	Transfer Function	control	Analysis	Tutorial , HW, Quiz
4-5	6	Block Diagram and Simple Flow Graph	control	Analysis	Tutorial , HW, Quiz
6	3	Mathematical Modeling of Physical Systems	control	Analysis	Tutorial , HW, Quiz
7	3	Time -Domain Analysis of Control Systems	control	Analysis	Tutorial , HW, Quiz

8	3	Nyquest Plot	control	Analysis	Tutorial , HW, Quiz
9	3	Basic Definitions In Measuring Devices	measurement	Analysis	Tutorial , HW, Quiz
10	3	The Static & Dynamic Measurements	measurement	Analysis	Tutorial , HW, Quiz
Course Evaluation					
Tests: 5% Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade. Assignments: (5%) There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade. Examinations There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook. Mid-Semester Exam: (15%)(15+15) Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9 . The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade. Final Exam: (60%) Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER212. The exam is worth 50% of the final grade.					
Learning and Teaching Resources					
Required textbooks (curricular books, if any)			- Modern Control Engineering (Ogata) - Engineering Measurements.		
Main references (sources)			Mathematical representation and electronic modeling programs for applying control and measurement issues		
Recommended books and references (scientific journals, reports...)			Mathematical representation and electronic modeling programs for applying control and measurement issues		
Electronic References, Websites			www.google.com		

Course Description Form

Course Name:					
Control Engineering and Measurements II					
Course Code:					
MEER423					
Semester / Year:					
First Semester/2023-2024					
Description Preparation Date:					
April 2024					
Available Attendance Forms:					
April 2024					
Number of Credit Hours (Total) / Number of Units (Total)					
5 hours per week / 4 units					
Course administrator's name (mention all, if more than one name)					
Name: Prof. Dr. muhammedabdulsattar Email: mohammed.aa.mohammed@nahrain.univ.edu					
Course Objectives					
Course Objectives			- Introduce the student about the details and control system and then starts steps by step - Explaining control section in addition for examining the application of both fields.		
Teaching and Learning Strategies					
Strategy	Introducing the student to the details and providing the basic elements for analyzing mechanical components, with a clear focus on the application of mechanical engineering. Introduction to measurements and devices used for measurements in electromechanical systems and an introduction to control systems.				
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Introduction root locus design	control	Analysis and lab	Tutorial , HW, Quiz

2-3	10	Stability root locus	control	Analysis and lab	Tutorial , HW, Quiz
4-5	10	Frequency response	control	Analysis and lab	Tutorial , HW, Quiz
6	5	Bode diagram	control	Analysis and lab	Tutorial , HW, Quiz
7	5	Phase margin and gain margin From semilog paper	control	Analysis and lab	Tutorial , HW, Quiz
8	5	Nyquist Plot	control	Analysis and lab	Tutorial , HW, Quiz
9	5	Basic Definitions In Measuring Devices vibration moyion	measurement	Analysis and lab	Tutorial , HW, Quiz
10	5	The Static & Dynamic Measurements	measurement	Analysis and lab	Tutorial , HW, Quiz

• Course Evaluation

Tests: 5%

Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade.

Assignments: (5%)

There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade.

Examinations

There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook.

Mid-Semester Exam: (15%)(15+15)

Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9 . The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade.

Final Exam: (60%)

Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER212. The exam is worth 50% of the final grade.

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	- Modern Control Engineering (Ogata) - Engineering Measurements.
Main references (sources)	Mathematical representation and electronic modeling programs for applying control and measurement issues
Recommended books and references (scientific journals, reports...)	Mathematical representation and electronic modeling programs for applying control and measurement issues
Electronic References, Websites	www.google.com

Course Description Form

Course Name:	Mechanical System Design
Course Code:	MEER424
Semester / Year:	Second / Fourth
Description Preparation Date:	2023-2024
Available Attendance Forms:	Class attendance and electronic meeting
Number of Credit Hours (Total) / Number of Units (Total)	4/2
Course administrator's name (mention all, if more than one name)	Name: Asst. Prof. Ghanim SH. Sadiq Email: Ghanim.S.Sadiq@nahrainuniv.edu.iq
Course Objectives	

Course Objectives			Give an introduction for various mechanical systems and design parameters used		
● Teaching and Learning Strategies					
Strategy	A- Knowledge and Understanding A1. An ability to apply knowledge of mathematics, science and engineering on mechanical systems. A2. learn the types of mechanical systems A3. An ability to identify mechanical systems B. Subject-specific skills B1. Analysis of the dynamic cases B2. Calculate and define the types of C- Problem analysis C1-Solving multi Mechanical Systems Design				
● Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Give full introduction to the mechanical systems	Introduction to the mechanical systems, types, function, and analysis strategies	Lectures	Exams, homework and quizzes
2	4	Explain Flexible Mechanical systems	Flexible Mechanical systems	Lectures	Exams, homework and quizzes
3	4	Describing Power Transmission systems	Power Transmission	Lectures	Exams, homework and quizzes
4	4	Explain	Case study	Lectures	Exams, homework and quizzes
5	4	Explain Hydraulic system components	Hydraulic components	Lectures	Exams, homework and quizzes
6	4	Explain Hydraulic system components	Hydraulic systems	Lectures	Exams, homework and quizzes
7	4	Take case study to explain Hydraulic system components	Case study	Lectures	Exams, homework and quizzes
8	4		Midterm examination		
9	4	Introduction to Analysis Tools, Finite-Element Analysis	Analysis Tools, Finite-Element Analysis	Lectures	Exams, homework and quizzes

10	4		Problems	Lectures	Exams, homework and quizzes
11	4	Introduction to Statistical Considerations for mechanical interface parts.	Statistical Considerations	Lectures	Exams, homework and quizzes
12	4	Case study for Statistical Considerations	Mechanical system case study	Lectures	Exams, homework and quizzes
13	4		Optional Topics	Lectures	Exams, homework and quizzes
14	4		Optional Topics	Lectures	Exams, homework and quizzes
15	4		Midterm examination II		

● Course Evaluation

Tests: 5%

Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade.

Assignments: (5%)

There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade.

Examinations

There will be two exams throughout the semester: a mid-semester exam which will be held in Week 8 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook.

Mid-Semester Exam: (15%)(15+15)

Mid-Semester exam1 will be held in Week 8 and Mid-Semester exam2 will be held in Week 15 . The mid-semester exam will examine material covered from Week 1 to Week 7. The mid-Semester exam is worth 20% of the final grade.

Final Exam: (60%)

Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER326. The exam is worth 50% of the final grade.

● Learning and Teaching Resources

Required textbooks (curricular books, if any)	Shigley's "Mechanical Engineering Design", Eighth Edition _ McGraw Hill 2006
Main references (sources)	Gupta," Mechanical Engineering Design " 2008, Niemman" machine elements "

Recommended books and references (scientific journals, reports...)	Some movies of real dynamics cases, Mechanical Systems
Electronic References, Websites	

Course Description Form

● Course Name:	
Advanced Computer Programming	
● Course Code:	
MEER413	
● Semester / Year:	
First semester / 4 th year	
● Description Preparation Date:	
2024\2\7	
● Available Attendance Forms:	
Class – Lab.	
● Number of Credit Hours (Total) / Number of Units (Total)	
4/3	
● Course administrator's name (mention all, if more than one name)	
Name: Dr. SuhaibjawadAlshbailat Email:suhaib.j.shbailat@nahrainuniv.edu.iq	
● Course Objectives	
Course Objectives	1. The program teaches (ANSYS) and FEM to use for mechanical engineering system design and analysis. Understanding modeling approaches, boundary conditions, and analysis outcomes helps designers make educated design decisions.

	2. The session shows how ANSYS and FEM can be integrated into engineering design. Students should learn how to use ANSYS to in a systematic design technique that considers functionality, manufacturability, and cost. 3. Learn to use ANSYS and FEM tools to optimize designs and improve engineering systems. Parametric analysis, sensitivity analysis, and optimization algorithms help develop designs and meet performance goals. 4. Evaluation of Simulation outcomes: Students learn to critically examine and interpret simulation outcomes. Students should evaluate ANSYS and FEM simulation results and comprehend model limitations and assumptions. 5. Learn to communicate and present ANSYS and FEM work. Technical papers, simulation visualizations, and ANSYS-based design advice are included.
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● Teaching and Learning Strategies

Strategy	Analyzing engineering problems to simulate them using the ANSYS program, finite element analysis, developing a strategy through homework and semester exams, and discussing related issues.
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● Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	1. Enhancing students' understanding of engineering concepts by providing them with the opportunity to simulate real world engineering systems. They learn how	Introduction to FEM, ANSYS and its Applications	Class – Lab.	Discussions and Homework

		model physical systems, analyze their behavior, and evaluate their performance under different conditions.			
2	4	1. Enhancing students' understanding of engineering concepts by providing them with the opportunity to simulate real world engineering systems. They learn how to model physical systems, analyze their behavior, and evaluate their performance under different conditions.	Spring Element Method	Class – Lab.	Discussions and Homework
3	4	1. Enhancing students' understanding of engineering concepts by providing them with the opportunity to simulate real world engineering systems. They learn how to model physical systems, analyze their behavior, and evaluate their performance under different conditions.	Bar Element(1-D) in Finite Element Method	Class – Lab.	Discussions and Homework
4	4	2. Developing and use simulation software with simulation programming so that students can develop simulation software that can be used to solve real world engineering problems. They learn how to use simulation software packages such as ANSYS and FEM to implement models to simulate engineering systems.	Bar Element(2-D) and (3-D) in Finite Element Method	Class – Lab.	Discussions and Homework
5	4	2. Developing and use simulation software with simulation programming so that students can develop simulation software that can be used to solve real world engineering problems. They learn how to use simulation software packages such as ANSYS and FEM to implement models to simulate engineering systems.	Beam Element in Finite Element Method	Class – Lab.	Discussions and Homework
6	4	4. Students learn how to communicate their simulation results effectively, both in written and oral form. They develop the ability to present their work to others, explain their approach, and justify their decisions.	Mid1-Exam	Class – Lab.	Discussions and Homework
7	4	2. Developing and use simulation software with simulation programming so that students can develop simulation software that can be used to solve real world engineering problems. They learn how to use simulation software packages such as ANSYS and FEM to implement models to simulate engineering systems.	Frame Structures Element in Finite Element Method	Class – Lab.	Discussions and Homework
8	4	2. Developing and use simulation software with simulation programming so that students can develop simulation software that can be used to solve real world engineering problems. They learn how to use simulation software packages such as ANSYS and FEM to implement models to simulate engineering systems.	Finite Element Modeling and Solution Techniques	Class – Lab.	Discussions and Homework
9	4	2. Developing and use simulation software with simulation programming so that students can develop simulation software that can be used to solve real world engineering problems. They learn how to use simulation software packages such as ANSYS and FEM to implement models to simulate engineering systems.	One-Dimensional Steady Heat Conduction Direct Method	Class – Lab.	Discussions and Homework
10	4	3. Learning how to simulate engineering systems, students develop a logical, systematic approach to problem solving which is a valuable skill in engineering. They learn how to identify and analyze a problem and develop a simulation model to solve it.	One-Dimensional Steady Heat Conduction Galerkin Method	Class – Lab.	Discussions and Homework

		evaluate the performance of the sys under different conditions.			
11	4	4. Students learn how to communicate t simulation results effectively, both in wri and oral form. They develop the abilit present their work to others, explain t approach, and justify their decisions.	Mid2-Exam	Class – Lab.	Discussions and Homework
12	4	3. Learning how to simulate enginee systems, students develop a logical systematic approach to problem sol which is a valuable skill in engineering. learn how to identify and analyse a prob develop a simulation model to solve it, evaluate the performance of the sys under different conditions.	Convection Boundary Conditions	Class – Lab.	Discussions and Homework
13	4	3. Learning how to simulate enginee systems, students develop a logical systematic approach to problem sol which is a valuable skill in engineering. learn how to identify and analyse a prob develop a simulation model to solve it, evaluate the performance of the sys under different conditions.	Plate and Shell Elements	Class – Lab.	Discussions and Homework
14	4	5. Working in teams to develop and complex simulation models by working group projects, discussing ideas, and sol problems together.	Project	Class – Lab.	Discussions and Homework
15	4	4. Students learn how to communicate t simulation results effectively, both in wri and oral form. They develop the abilit present their work to others, explain t approach, and justify their decisions.	Final-Exam	Class – Lab.	

● Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, dailyoral, monthly, or written exams, reportsetc

Homework	(5 %)
Mid-Semester Exam	(10 %)
Quiz	(5 %)
Project	(10 %)
Final Lab Exam	(10 %)
Final Exam	60 %

● Learning and Teaching Resources

Required textbooks (curricular books, if any)	Finite Element Analysis Theory and Application with ANSYS , fourth edition, SaeedMoaveni
Main references (sources)	Finite Element Analysis Theory and Application with ANSYS , fourth edition, SaeedMoaveni
Recommended books and references (scientific journals, reports...)	1. Engineering Analysis with ANSYS Software Y. Nakasone, S. Yoshimoto and T. A. Stolarski 2. Finite Element Analysis Theory and Application with ANSYS , Fourth Edition, SaeedMoaveni

Electronic References, Websites	https://www.ansys.com/academic/learning-resource

Course Description Form

● Course Name:	
Computer Applications	
● Course Code:	
MEER423	
● Semester / Year:	
Second semester / 4 th year	
● Description Preparation Date:	
2024\2\7	
● Available Attendance Forms:	
Class – Lab.	
● Number of Credit Hours (Total) / Number of Units (Total)	
4/3	
● Course administrator's name (mention all, if more than one name)	
Name: Dr. SuhaibjawadAlshbailat Email:suhaib.j.shbailat@nahrainuniv.edu.iq	
● Course Objectives	
Course Objectives	1. <i>Engineering Skills Enhancement: Participants acquire the skills to apply MATLAB effectively to solve real-world engineering problems, making them more competitive in their field.</i> 2. <i>Problem-Solving Abilities: The course equips individuals with the ability to analyze complex engineering challenges, develop models, and derive solutions using MATLAB.</i> 3. <i>Career Advancement: MATLAB proficiency is highly regarded in the engineering industry, which can lead to better job opportunities and career advancement.</i>
● Teaching and Learning Strategies	
Strategy	<i>Analyzing engineering problems using the MATLAB program, developing a strategy through homework and semester exams, and discussing related issues.</i>
● Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	1. Enhancing students' knowledge of programming languages, such as MATLAB. It provides them with the opportunity to learn advanced programming concepts, such as data structures, algorithms, and object oriented programming, which can be applied to solve complex engineering problems.	Introduction to MATLAB and its Applications	Class – Lab.	Discussions and Homework
2	4	1. Enhancing students' knowledge of programming languages, such as MATLAB. It provides them with the opportunity to learn advanced programming concepts, such as data structures, algorithms, and object oriented programming, which can be applied to solve complex engineering problems.	Two-Dimensional Plots	Class – Lab.	Discussions and Homework
3	4	1. Enhancing students' knowledge of programming languages, such as MATLAB. It provides them with the opportunity to learn advanced programming concepts, such as data structures, algorithms, and object oriented programming, which can be applied to solve complex engineering problems.	Three-Dimensional Plots	Class – Lab.	Discussions and Homework
4	4	2. Developing engineering applications with advanced programming skills, students can develop engineering applications, such as static, fluid, and heat transfer, that can help solve real world problems. The course enables them to use programming tools and libraries to implement algorithms and models that are used in these applications.	Polynomials, Curve Fitting, and Interpolation	Class – Lab.	Discussions and Homework
5	4	2. Developing engineering applications with advanced programming skills, students can develop engineering applications, such as static, fluid, and heat transfer, that can help solve real world problems. The course enables them to use programming tools and libraries to implement algorithms and models that are used in these applications.	Applications in Numerical Analysis I	Class – Lab.	Discussions and Homework
6	4	2. Developing engineering applications with advanced programming skills, students can develop engineering applications, such as static, fluid, and heat transfer, that can help solve real world problems. The course enables them to use programming tools and libraries to implement algorithms and models that are used in these applications.	Applications in Numerical Analysis II	Class – Lab.	Discussions and Homework
7	4	3. Students develop a logical and systematic approach to problem solving, which is a valuable skill in engineering. They learn how to identify and analyze a problem, develop an algorithm or model to solve it, and implement and test the solution using programming.	FDM	Class – Lab.	Discussions and Homework
8	4	3. Students develop a logical and systematic approach to problem solving, which is a valuable skill in engineering. They learn how to identify and analyze a	FDM	Class – Lab.	Discussions and Homework

		problem, develop an algorithm or model to solve it, and implement and test the solution using programming.			
9	4	4. Students learn how to communicate their engineering programming ideas and solutions effectively, both in written and oral form. They develop the ability to present their work to others, explain their approach, and justify their decisions.	Mid-Semester Exam	Class – Lab.	Discussions and Homework
10	4	2. Developing engineering applications with advanced programming skills, students can develop engineering applications, such as static, fluid, and heat transfer, that can help solve real world problems. The course enables them to use programming tools and libraries to implement algorithms and models that are used in these applications.	Applications in Engineering Mechanics	Class – Lab.	Discussions and Homework
11	4	2. Developing engineering applications with advanced programming skills, students can develop engineering applications, such as static, fluid, and heat transfer, that can help solve real world problems. The course enables them to use programming tools and libraries to implement algorithms and models that are used in these applications.	Applications in Mechanical Vibrations	Class – Lab.	Discussions and Homework
12	4	2. Developing engineering applications with advanced programming skills, students can develop engineering applications, such as static, fluid, and heat transfer, that can help solve real world problems. The course enables them to use programming tools and libraries to implement algorithms and models that are used in these applications.	Applications in Heat Transfer	Class – Lab.	Discussions and Homework
13	4	2. Developing engineering applications with advanced programming skills, students can develop engineering applications, such as static, fluid, and heat transfer, that can help solve real world problems. The course enables them to use programming tools and libraries to implement algorithms and models that are used in these applications.	Applications in Fluid Mechanics	Class – Lab.	Discussions and Homework
14	4	5. Working in teams to develop and test complex programming models by working on group projects, discussing ideas, and solving problems together.	Project	Class – Lab.	Discussions and Homework
15	4	4. Students learn how to communicate their engineering programming ideas and solutions effectively, both in written and oral form. They develop the ability to present their work to others, explain their approach, and justify their decisions.	Final Exam	Class – Lab.	

● Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, dailyoral, monthly, or written exams, reportsetc

Homework	(5 %)
Mid-Semester Exam	(10 %)
Quiz	(5 %)
Project	(10 %)
Final Lab Exam	(10 %)
Final Exam	60 %

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	MATLAB An Introduction with Applications, Sixth Edition, Amos Gilat
Main references (sources)	MATLAB An Introduction with Applications, Sixth Edition, Amos Gilat
Recommended books and references (scientific journals, reports...)	3. MATLAB: An Introduction with Applications, Rao V. Dukkipati Engineering Applications Analytical and Numerical Calculation with MATLAB, Mihai Dupac, Dan Marghitu
Electronic References, Websites	https://www.mathworks.com/academia.html?s_tid=gn_acad

Course Description Form

Course Name:	
Power Plants I	
Course Code:	
MEER414	
Semester / Year:	
First Semester/2023-2024	
Description Preparation Date:	
April 2024	
Available Attendance Forms:	
April 2024	
Number of Credit Hours (Total) / Number of Units (Total)	
2The. hours per week / 2 units	
Course administrator's name (mention all, if more than one name)	
Name: Asst. Prof. Dr. Mahmoud Sh. Mahmoud Email: mahmoud.s.mahmoud@nahrainuniv.edu.iq	
Course Objectives	
Course Objectives	Introducing the student to the details and cycles conditions for energy

			production and then starting with the steps step by step..... ● Explanation of the thermodynamics section, in addition to studying the application of both fields and the improvements that can be made to improve efficiency.		
● Teaching and Learning Strategies					
Strategy		Introduce the student about the analysis of the power plant and its main parts of steam generator and turbines, as well as power plants with renewable energy resources.			
● Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	CLO-1: Explain the principals of thermodynamics cycles and their application in power plant systems.	Introductory Concepts	Analysis	Tutorial , HW, Quiz
2-3	4	CLO-1: Explain the main components of power plants.	thermodynamics cycles	Analysis	Tutorial , HW, Quiz
4-5	4	CLO-2: Compute the pressure and hydrostatic pressure force at various locations in a fluid.	Power plants components	Analysis	Tutorial , HW, Quiz
6	2	CLO-3: Using steam table and mollier chart and their role in power plant systems.	Rankin Regenerative, Reheat-Regenerative Cycle	Analysis	Tutorial , HW, Quiz
7	2	CLO-3: Understanding main ideal and actual Rankin cycle with its Improvements.	Open-Contact Feed Water Heaters (FWH), Closed Type FWH with Drains Cascade Backward.	Analysis	Tutorial , HW, Quiz
8	2	CLO-4: Understanding main ideal and actual gas turbine cycle with its Improvements.	Gas Turbine Cycles, Brayton Cycle	Analysis	Tutorial , HW, Quiz
9	2	CLO-5: Understanding main ideal and actual gas turbine cycle with its Improvements.	Gas Turbine Cycle with Inter-cooling, Reheat and Heat Exchanger	Analysis	Tutorial , HW, Quiz
10	2	CLO-6: Developing skills for a stand-alone or combined power plant systems.	Dual and combines cycle	Analysis	Tutorial , HW, Quiz
● Course Evaluation					
Tests: 5% Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade. Assignments: (5%)					

There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade.

Examinations

There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook.

Mid-Semester Exam: (15%)(15+15)

Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9. The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade.

Final Exam: (60%)

Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER212. The exam is worth 50% of the final grade.

- Learning and Teaching Resources

Required textbooks (curricular books, if any)	Applied Thermodynamics for Engineering Technologists by T. D. Eastop and A. McConkey.
Main references (sources)	Theory of Power Plant by Alwakeel.
Recommended books and references (scientific journals, reports...)	Solar Energy Engineering: Processes and Systems by SoterisKalogirou.
Electronic References, Websites	www.googleclassroom.com

Course Description Form

• Course Name:
Power Plants II
• Course Code:
MEER424
• Semester / Year:
Second Semester/2023-2024
• Description Preparation Date:
April 2024
• Available Attendance Forms:
April 2024
• Number of Credit Hours (Total) / Number of Units (Total)
2The. + 2 Exp.hours per week / 2 units
• Course administrator's name (mention all, if more than one name)
Name: Asst. Prof. Dr. Mahmoud Sh. Mahmoud Email: mahmoud.s.mahmoud@nahrainuniv.edu.iq

● Course Objectives					
Course Objectives			● Introducing the student to the details and cycles conditions for energy production and then starting with the steps step by step..... ● Explanation of the thermodynamics section, in addition to studying the application of both fields and the improvements that can be made to improve efficiency.		
● Teaching and Learning Strategies					
Strategy		Introduce the student to the power plant economics variables factors, power plants main parts like steam generators and turbines, types of steam generator and turbines, as well as power plants with renewable energy resources.			
● Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	CLO-1: Explain the principals of Steam Generator, Classification and Heat Balance.	Introductory Concepts	Analysis	Tutorial , HW, Quiz
2-3	4	CLO-1: Explain Fundamentals of Steam Turbine Systems.	Steam Turbine Systems	Analysis	Tutorial , HW, Quiz
4-5	4	CLO-2: Impulse Turbine, Pressure & Velocity Compound.	Steam Turbine Systems	Analysis	Tutorial , HW, Quiz
6	2	CLO-3: Reaction Turbine, Axial-Flow Turbines.	Steam Turbine Systems	Analysis	Tutorial , HW, Quiz
7	2	CLO-3: Understanding main renewable energy resources.	Renewable Energy Resources	Analysis	Tutorial , HW, Quiz
8	2	CLO-4: Understanding main concepts for PV solar cells.	Solar Energy Plants	Analysis	Tutorial , HW, Quiz
9	2	CLO-5: Understanding main conceptsfor wind energy plants.	Wind Energy Plants	Analysis	Tutorial , HW, Quiz
10	2	CLO-6: Developing skills for Power Plant Economics & Variable Load Problem.	Power Plant Economics	Analysis	Tutorial , HW, Quiz
● Course Evaluation					
Tests: 5%					

Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade.

Assignments: (5%)

There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade.

Examinations

There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator. Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook.

Mid-Semester Exam: (15%)(10+10)

Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9. The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade.

Laboratory (15%)

Reports for the experiments in addition to final exam in the experiments that was covered during the semester.

Final Exam: (60%)

Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER212. The exam is worth 50% of the final grade.

- Learning and Teaching Resources

Required textbooks (curricular books, if any)	Applied Thermodynamics for Engineering Technologists by T. D. Eastop and A. McConkey.
Main references (sources)	Theory of Power Plant by Alwakeel.
Recommended books and references (scientific journals, reports...)	Solar Energy Engineering: Processes and Systems by Soteris Kalogirou.
Electronic References, Websites	www.googleclassrom.com

Course Description Form

• Course Name:
Professional Ethics
• Course Code:
UREQ421
• Semester / Year:
Second /Fourth
• Description Preparation Date:
2/4/2024
• Available Attendance Forms:
In person + electronic
• Number of Credit Hours (Total) / Number of Units (Total)
3/3
• Course administrator's name (mention all, if more than one name)

Name: Asst. Prof. Dr. Ali H. Al-helli

Email:: ali.h.mohammed@nahrainuniv.edu.iq

● Course Objectives

Course Objectives	1: Enabling the student to know the main principles of the most prominent ethics of engineering profession, its sources and types, and the mechanisms used for its purpose. 2: Enabling the student to know all the basics that he uses in the scientific subject 3: The soft skills objectives of the course. The students were able to acquire the b information necessary to liberate it from all violations, to know the most important eth and to instill a sense of responsibility towards their individual rights and public interest To learn to use standard practices and standard data. 4: Familiarizing students with the ethics of scientific research, the mechanism of wri reports and projects, and scientific honesty, and introducing them to the citation mechan and the seriousness of scientific plagiarism.
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● Teaching and Learning Strategies

Strategy	Lectures, lessons, case studies
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● Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	1	Introduction. The concept of professional ethics. general concept. Linguistic concept.	Lectures, lessons, case studies	Activity, Assignments, exams
2	1	1	Terminological concept. The importance of professional ethics in life.	Lectures, lessons, case studies	Activity, Assignments, exams
3	1	1	The importance of the client in life. The important elements of professional ethics. Conscience, interest, regulations and systems, work organization, work contract, work control.	Lectures, lessons, case studies	Activity, Assignments, exams
4	1	1	Ethics related to professional ethics.	Lectures, lessons, case studies	Activity, Assignments, exams
5	1	1	Honesty at work, honesty, advice, justice.	Lectures, lessons, case studies	Activity, Assignments, exams
6	1	1	Forgiveness, humility, forbearance, patience.	Lectures, lessons, case studies	Activity, Assignments, exams
7	1	2	Engineering ethics: introduction, engineering practice.	Lectures, lessons, case studies	Activity, Assignments, exams
8	1	2	Blog history, engineering disasters.	Lectures, lessons, case studies	Activity, Assignments, exams

9	1	2	Examples of Codes of Engineering Ethics: Code of Hammurabi, Code of ABBT.	Lectures, lessons, case studies	Activity, Assignments, exams
10	1	3	Ethics of scientific research, scientific honesty, verification.	Lectures, lessons, case studies	Activity, Assignments, exams
11	1	3	Inference and review, the relationship of honesty to scientific right in progress and development.	Lectures, lessons, case studies	Activity, Assignments, exams
12	1	3	Quotation and plagiarism in the scientific field, the difference between quotation and plagiarism, inference and its mechanisms.	Lectures, lessons, case studies	Activity, Assignments, exams
13	1	4	Quotation and plagiarism in the scientific field, the difference between quotation and plagiarism, inference and its mechanisms.	Lectures, lessons, case studies	Activity, Assignments, exams
14	1	4	Quotation and plagiarism in the scientific field, the difference between quotation and plagiarism, inference and its mechanisms.	Lectures, lessons, case studies	Activity, Assignments, exams
15	1	4	Quotation and plagiarism in the scientific field, the difference between quotation and plagiarism, inference and its mechanisms.	Lectures, lessons, case studies	Activity, Assignments, exams
16	1	4	Preparatory week before the final Exam	Lectures, lessons, case studies	Activity, Assignments, exams
● Course Evaluation Daily 5, assignments 5, reports 10, semester exams 20, final exam 60					
● Learning and Teaching Resources					
Required textbooks (curricular books, if any)			(قواعد واخلاقيات ممارسة المهن الهندسية (دنبيل عبد الرزاق جاسم		
Main references (sources)			(قواعد واخلاقيات ممارسة المهن الهندسية (دنبيل عبد الرزاق جاسم		
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					

Course Description Form

● Course Name:
Turbomachines
● Course Code:
MMEER415
● Semester / Year:

First Semester/2023-2024					
Description Preparation Date:					
April 2024					
Available Attendance Forms:					
Full Time					
Number of Credit Hours (Total) / Number of Units (Total)					
3 hours per week / 3 units					
Course administrator's name (mention all, if more than one name)					
Name: Asst. Prof. Dr. Farhan Ahmed Khammas					
Email: farhan.a.khammas@nahrainuniv.edu.iq					
Course Objectives					
Course Objectives			- Introduce the student about the details and Turbomachines state and then starts steps by step - Explaining all section in addition for examining the application of both fields.		
Teaching and Learning Strategies					
Strategy	Basic fundamentals of turbomachines and its applications for field problems in determinates, turbomachines efficiency, wind properties, static pressure, air density, kinetic energy, potential energy, viscosity, temperature ratio, dynamic pressure, series solution of solving turbomachines problems				
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	GO-1: An ability to identify , formulate , and solve complex engineering problems by applying principles of engineering , science, and mathematics.	Turbomachines concept	Analysis	Tutorial , HW, Quiz
2	6	GO-1: An ability to identify , formulate , and solve complex engineering problems by applying principles of engineering , science, and mathematics.	turbomachines sources, part 1	Analysis	Tutorial , HW, Quiz
3	6	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of	Turbomachines sources, part 2	Analysis	Tutorial , HW, Quiz

		public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.			
4	3	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	The future of Turbomachines	Analysis	Tutorial , HW, Quiz
5	3	GO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health , safety, and welfare, as well as global , cultural , social , environmental , and economic factors.	Atmosphere properties	Analysis	Tutorial , HW, Quiz
6	3	GO-3: An ability to communicate effectively with a range of audiences.	Turbomachines types part 1	Analysis	Tutorial , HW, Quiz
7	3	GO-3: An ability to communicate effectively with a range of audiences.	Mid Exam.1	Analysis	Tutorial , HW, Quiz
8	3	GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Turbomachines types part 2	Analysis	Tutorial , HW, Quiz
9		GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Centrifugal pumps.	Analysis	Tutorial , HW, Quiz

10		GO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Solv the tutorial problems of Centrifugal pumps Function-1	Analysis	Tutorial , HW, Quiz
11		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Centrifugal pumps Function-2 Water turbines	Analysis	Tutorial , HW, Quiz
12		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Water turbines	Analysis	Tutorial , HW, Quiz
13		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Solv the tutorial problems of Water turbines	Analysis	Tutorial , HW, Quiz
14		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Solv the tutorial problems of Water turbines	Analysis	Tutorial , HW, Quiz
15		GO-7:An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Mid Exam .2	Analysis	Tutorial , HW, Quiz

● Course Evaluation

Tests: 5%

Tests are intended to reinforce and support material discussed in lectures. Tests are compulsory. Students are required to submit tests from taught tutorials. Tests will be assigned 5% of the final grade.

Assignments: (5%)

There will be two assignments throughout the semester. The assignment will be based on running case study for material covered from Week 2 to Week 12. The assignments purpose is to gain experience and understanding of management information systems. Each assignment is worth 5% of the final grade.

Examinations

There will be two exams throughout the semester: a mid-semester exam which will be held in Week 9 and a final exam which is scheduled during the examination period. Both exams will be closed-book and with short-answer, short essay, and discussion questions. For these exams students may bring a non-programmable calculator.

Programmable calculators, mobiles and other computing or communication devices are NOT permitted. For more information refer to student handbook.

Mid-Semester Exam: (15%)(15+15)

Mid-Semester exam1 will be held in Week 7 and Mid-Semester exam2 will be held in Week 9 . The mid-semester exam will examine material covered from Week 1 to Week 8. The mid-Semester exam is worth 20% of the final grade.

Final Exam: (60%)

Final exam will be held during the final examination period. The exam paper will test all the lectures covered in MEER415, The exam is worth 50% of the final grade.	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	- Introduction in turbomachinery - Centrifugal pumps - Water turbines Fundamentals
Main references (sources)	- CORE TEXTS · COURSE MATERIALS · OTHER
Recommended books and references (scientific journals, reports...)	- Advanced Engineering Mathematics for engineers and scientists by M. R. Spiegel. - Advanced Engineering Mathematics by S.S.Sastry.
Electronic References, Websites	Special requirements (include for example workshops, periodicals, IT software, websites)